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The AMERICAN RIFLEMAN

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NUMBER 14

DECEMBER 15, 1924

Who Will Be Regulated Next?

By Charles Askins

The Great God Gun

By Chauncey Thomas

Rifle Projectiles During Flight

By William Tindall

"So This Is Lima"

By Capt. E. C. Crossman

Pressure Curves of Shotgun Powders

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The Model 1866 Winchester

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The AMERICAN RIFLEMAN

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WASHINGTON, D. C., DECEMBER 15, 1924

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Who Will Be Regulated Next?

By Capt. Charles Askins

OUR self-constituted band of human conduct governors who have assumed the task of regulating the moral, religious, spiritual, physical, social, and recreational activities of the world have learned one thing—They have found a great bundle of habit sticks to break, and they know very well that the only way they can break that bundle is one stick at a time.

Just now they can see that the good of the world demands the elimination of all wars. How best can wars be eliminated? The best plan in sight is to deprive people of all firearms and of all skill in their use. No one has ever maintained that heaven is to contain one single rifle, shotgun or pistol, and if we are ever to have heaven on earth, we must do away with such murderous tools here. All in due course of time we may expect to hear the doctrine preached that any man who advocates skill in the use of firearms already has a one-way ticket straight to hell.

Why not take the bull by the horns, then, and tell us that all firearms are to be done away with? Simply because wisdom dictates the breaking of one stick at a time. Suppose we were told that no more rifles or pistols or shotguns were to be tolerated, a devil of a fight would be on right then. But suppose they merely take up pistols, the weakest stick in the bundle? The rifleman is not much interested; it is not his funeral. It is not the funeral of the shotgun man either. But hold on, fellows, your stick is the next one in the bundle. The same lads that now mean to legislate pistols out of existence made the quail a song bird in Ohio. With the short gun out of the way it is only a question of time when our band of regulators will be holding a wake over you.

How do I know all this? I know it by the history of the men and women who have constituted themselves the moral and religious and social and recreational governors of the world. Why say history? Well, like the poor, we have had these people with us always, and always will have them. Way back in Old England Cromwell's "round-heads" went up and down the breadth of the land killing people in the name of the Lord. The descendants of Cromwell's Ironsides, coming to this country and finding no one else to regulate, proceeded to regulate one another. Were they happy in the process? Nobody has ever said so. We are told that they were the most priest-ridden lot of dour and sour faced fanatics that the world has ever seen. Every man made it

a habit and a lifetime practice to learn the things which his neighbor did or would like to do, things which he did not care to do himself, and straightway, or sooner if possible, that thing was forbidden. If any man or any woman appeared to be unduly happy or unduly contented, he or she was a subject of serious inquiry, by way of seeing if some rule couldn't be made which would end such unholy joy.

They prescribed the number of hours daily which a man must work, the number of times which he must attend church through the week and on the Sabbath, the number of prayers which he must say in a day and their length, the kind of meals he must eat and when they should be cooked. A man's or woman's dress was subject to rigid ruling. If a girl was seen with "ribbands" in her hair she went into the stocks; if a man were known to have worn homespun breeches on the day that leather breeches were called for he got a public thrashing. So many times a man could kiss his wife on week days, but the Lord help him if he were caught at it on Sunday. For diversion, since all the men were needed to fight Indians, they hung a woman now and then for witchcraft.

Here are the principles or motives that seem to actuate our great tribe of regulators—First, find something that the other fellow wants to do and you do not; second, make him cease doing the thing that he wants to do; third, make him do something that he doesn't want to do; fourth, prosecute him until he is willing to obey; fifth, watch him rage in impotent wrath, for that is where the fun comes in. Do not forget that no man or set of men is going to work tooth and nail for any particular object unless he gets a deal of satisfaction out of it. If all of us could of a sudden make up our minds to yield cheerful and prompt obedience to everything our fanatics want done, the whole zest of life would be destroyed for them. I haven't any doubt at all but if people should conclude that they didn't care to use a firearm again, pistol, rifle, or shotgun, either for pleasure or sport or national defense—would let it be known finally that they absolutely refused to fire a gun—our fanatics would switch about with a tremendous roar for the needs of national defense and make 'em do it. Somebody has said that the keenest joy in life lies not in the things accomplished, but in the work whereby the thing was done. Any good, honest regulator will freely admit that if he couldn't make people squirm and (Continued on Page 14)

The Great God Gun

By Chauncey Thomas

"Heathen Idol made of mud,
That they called "The Great God Bud."

—Kipling.

CHANGE the cartridge or load and you change the conditions of reloading. There are some more or less universal rules about reloading, fundamentals that apply directly to all cartridges, but there seems to be a separate and distinct set of sub-rules for each particular cartridge; also for different loads in the same cartridge, such as spitzer bullets vs. round nose, or lead vs. metal patch.

When I married No. 23 of the Olympic free rifle we set up housekeeping with 900 odd rounds of 1923 match arsenal cartridges. I had empties enough in the future to reload to wear out the barrel—but I didn't. The primers are riveted in. No ordinary soft steel de-capper pin would shove them out, so I had one turned and tempered from machine rod steel. That drove the old primers out. Then I had a high collar of brass round each primer hole. "Mike" said that a No. 4 twist drill would just fit the primer hole, as the drill was of the same caliber as the No. 8½ Remington primers. But trouble some more.

Riveting in those primers seems to have upset the metal in the base of the shells from zero to as much as 5/1000ths. Nothing even about the size of those holes, so it was a lathe matter to cut them out evenly, and I have no lathe. So I gave the 400 odd match 1923 empties to Howard. He had a lathe, a cheerful disposition, and no troubles—he still has the lathe and the empties.

Whelen sagely remarks in his book, "The American Rifle," that the .30-40 (Krag) shells is the best all around size in America, especially for the reloader. Kenos. I have resized hundreds of them, but one day innocently tackled the '06 discards. Just the difference between filing soft and tempered steel. Three or four and I quit sweating and attended to the blisters. Then just to see, I tried the .30-30 rimless Remington, and they are just as hard although the ordinary rim .30-30 shell is as soft as the .30-40. Why?

Long ago when Noah and I were loading pigeon shells I learned not to have two rifles that used the same shell. It can be endured if one religiously resizes after every shoot, otherwise he needs a straight jacked with a flapless pocket that will just hold the Testament. Reloads from one batch or belt or box will steal in the night, I think, into the wrong place, then there is not a ramrod within five miles, and no more shooting after that first false step, but tramp, tramp, tramp—sell one of them, sure.

For .30-30 rims and .30-40 Krag I like the Winchester 1894 tool, but sold mine, and am scouting for another high and hard. Some generous soul take pity—I have to chase them with a club, and too much snugness is

spoiling my lovely disposition just like the fat lady in August and a perfect 38 corset. But stick a shell in one of those 1894 tool, closed as it is at the lower end, and usually the head comes off just to make things real nice and interesting, then you have a job on your hands and stop reloading right then and there till it is attended to. I tried clamping the protruding part of the shell in the vise—a vise or two are not usually mentioned in the optimisting reloading tool ads, all complete at \$3.50—but that merely twisted off the brass. Pincers did not get a good bite, either. I have half a dozen pincers, must have them, various sizes. They are not in the tool ads, either. Then I cooked the brute, and while it did not lessen the shell it did the tool no good, for the tool inside is ground to size and shape, polished and tempered to resist wear. Then I took a hard wood sliver, drove it as a wedge down between the steel and the brass. That bent the shell in toward its own center, and it practically fell out. Easy when you know how. It took me about a day of scattered hours to find out.

To get a broken shell out of a common cylindrical resizing die, either have a punch—not mentioned in the tool ads—that fits the neck hole snugly, this will catch on the shoulder of the neck and drive it out all right. If you have no punch, then upset lead in the die ahead of the shell, just as one takes a broken shell from a rifle chamber. In resizing I use an oiled cloth, and oil about every third shell. Necking the same.

Once I had trouble with primers, it was during the war, and primers and shell holes varied a good deal in size for a while. Yelled about it in the magazine columns, and some kindly genius wrote in to say that if I would only oil the primer holes the primers would go in all right. Certainly, and next week when that helpful oil had worked into the primer composition—What then? So I did not oil the primer holes.

Shells vary a good deal in thickness, same makes, and often much more variation in brass thickness between the various makes. Some shells have such thin neck walls that neither the resizer nor the necker will reduce them enough to hold the bullet. Of course we all know of the lateral crimp—that is, for beginners I mean, just make the neck of the shell oval with pliers or otherwise, and the spring of the brass will hold the bullet lightly in place, snug enough to shoot singleshoot, but never use them through the magazine or you may suddenly swap the remains of your gun for a good harp. Another trick is simply to crimp the shell, then use the boat tail bullet. Keep such reloads separate from the regular run, by the way.

I have been grayhaired since I was twenty-five, and it was about that time I began setting

the Ideal powder measure for various loads. If you have a rich aunt that is old and human, have a powder measure for each load, and after screwing its set screw doubletight, leave it alone. But as reloading is warranted to keep one on the door step of the country farm—where there is plenty of room to shoot, presumably—then you might try this: After about half a frowning hour over the scales, counting specks, and all that, and the measure at last is throwing 16 plus or minus ¼ to 1/3 grain, and all is well, take a small bolt about ½- to ¾-in. long, with a tight nut on it, and fasten the bolt in the vise, and adjust that nut so that bolt and nut snugly, neatly fit into the powder hole of the measure, after the powder is poured out, of course. That is your gauge for say 38 grains. No. 16, a fine .30-40 load, by the way, with the 220-grain bullet. Adjust these bolts by screwing the nut to the right place, which gives practical micrometer accuracy. The bolt should not reach entirely through the nut, of course. If it does so, file off the bolt enough so that it will not go all the way through the nut when you have the bolt and nut about the right length to fit into the powderhole of the measure. Then next time when you want the Krag load, just put this 5-cent bolt-nut gauge into the measure, shove the slides snugly up against it, set slide screw, take out the bolt-nut gauge, and you have saved yourself a whole lot of trouble over the scales. But even then, trust not too much in appearances. My dark, damp, dank pessimistic nature suggests that after all is set, as the cowpunchers say, then weigh a charge to make sure. A Springfield powder charge in a Krag shell might mean another harp. Smokeless powder doth make cowards of us all, as Shakespeare didn't say.

It is real nice to fill about 90 shells and then tip one over and see it play nine-pines, or rather ninety-nine pins. Loading blocks saveth the soul. The orthodox way is to bore augur holes in a block of wood, then nail a thin board to the bottom and you have your loading block. But often the shells are too big for the blocks on hand. (Never loan reloading tools. Nor guns.)

Suppose now you take a cigar box, rip off the lid, make a few quick optical measurements, and wind a string around the box first one way, say about half-inch apart for '06 shells, then around the box the other way. This will give you a checkerboard effect, each shell roped off into a half inch square space of its own. Cost, one cigar box, 50 feet of string, and two minutes time. Not as good as the bo ed block, but a heap better than none.

Some folks like to make sights. Next to making holsters that suit no one, it is the grandest amusement in America. Now filing out wire-like posts (Continued on Page 15)

Attitude of Rifle Projectiles During Flight

By William Tindall, LL. B.

THE purpose of this treatise is to develop the details of the principle that rotating spheres, and cylinders rotating on their long axes, incur during their flight a dominant atmospheric friction on some part of their respective surfaces which impels their mass away from the point where such maximum friction occurs and converts the direction of their flight into a curve.

The explanation of the lateral diversion of rifle projectiles from the plane of their departure from the gun, as announced by some accepted authorities on ordnance ballistics, attributes the diversion to the right of that plane to the operation of a complicated philosophical principle and the diversion to the left of that plane to the occurrence of a mere incident that has no philosophical relation to the phenomenon.

The observation, reading and reasoning of the author of the following discussion of the subject have led him to the conclusion that *the drift to the left is due to an application of force exactly the reverse of the influence that diverts the projectile to the right; that both phenomena are based on readily understood philosophical principles, and that it is not necessary to invoke an incidental occurrence to account for either of them.*

The statistics herein used respecting range, altitudes of trajectories and the direction and extent of the drift of rifle projectiles, both to the left and to the right, are based on data contained in a publication, issued some time ago by the War Department, which includes a very interesting record of ballistic tests of infantry projectiles. It is believed that the data thus furnished are accurate, but even if they were not entirely so in respect to unimportant items, such inaccuracy would in no wise impair the argument that those data are used to support in the following discussion of the general principles involved.

The date when rifling was first applied to firearms is unknown, nor is anything more definite recorded of the person who first so applied it. So long ago as 1498, rifled firearms were used in Leipsic, Germany, and there are accounts of their use in Switzerland at the same time.

By rifling is meant the cutting of grooves on the inside of the barrel of firearms, which twist like the threads of a screw but not so frequently. In a modern United States Army rifle barrel 24 inches long, the rifling twists nearly 2 2/5 times. The object of this rifling is to impart a revolving motion to the projectile on its long axis, similar to the spinning of a top. In the Whitworth rifle the bore of the barrel was a helix, and the projectile formed to fit it. Rotation in some other systems was effected by lugs on the projectile which were designed to fit in the grooves.

At first the grooves were made parallel to the long axis of the barrel, and straight. This

arrangement of the grooves apparently gave little or no greater advantage to the firearm than to afford a receptacle to catch the residuum left in the barrel of the gun by the combustion of the powder. The refuse consequently offered less obstruction to the discharge of the bullet than would have obtained

THE accompanying paper by Doctor William Tindall will be of especial interest to readers of the RIFLEMAN. It relates to the subject of the drift of rifle projectiles, and in it the author has set forth his views with uncommon clarity and in terms that will be readily understood by every reader. The paper has the additional merit of being free from the pedantic and wholly unnecessary display of abstruse mathematical formulas with which some writers on similar subjects often exploit their own vanity and befuddle their readers. As to the theories advanced by Doctor Tindall the Editors, of course, can express no opinion. No one but a ballistic scientist is competent to express such an opinion that will deserve serious consideration. In behalf of the author of the paper the Editors invite criticism of it by those whose signatures shall be such as to convey assurance that their views deserve to be published.—EDITORS.

if the residuum had covered the entire inner surface of the barrel.

The adoption of rifling to firearms may have been accidental as many other improvements in human utensils have been, but it was the practice of archers of those days, and doubtless for an indefinite period before them, to adjust feathers upon their arrows in a spiral form. This imparted to the arrows a rotating motion on their long axes which

FIGURE 1



Beveled head of Indian Arrow.

gave considerable stability to them during their flight and was an advantage that may have suggested that rotation of a rifle projectile might be equally or more serviceable in controlling the direction of its course.

It is beyond doubt that the principle of rotation or spinning of arrows was practiced if not understood by some of the American Indians. The writer of this discussion found among the American Indian arrowheads in the collection of such implements in the Smithsonian Institution, at Washington, a stone arrowhead which was formed with a double beveled point so that the opposition of the

air to its progress in flight would cause it to revolve: thus—(Fig. 1).

Mr. Thomas Wilson, who was then Curator of that Institution, and to whom the writer showed and explained that arrowhead, was so impressed with the significance of the discovery that, at the writer's suggestion, he experimented with it by mounting it on a pivot in each end and blowing upon its point with a bellows which caused it to revolve with great velocity. He then wrote an account of his demonstration which was published in one of the Smithsonian Institution reports.

When the spiral rifling was first applied to firearms its use was prohibited by law of the Swiss Cantons, because the greater range and accuracy of the flight of projectiles discharged from such firearms, in comparison with the flight of projectiles from smooth-bore guns and straight-grooved rifles, gave rise to discord among the competitors at the shooting matches there.

It is a quite general but erroneous impression that the curving of a sphere in flight was a discovery in connection with the curving of a base ball; but the fact is that the phenomenon has been observed in the flight of all sorts of spherical projectiles from time immemorial. One of the conspicuous features of tennis, which was a favorite game of the Romans and doubtless of other peoples of much remoter antiquity, is the curving of the tennis ball and as such is often referred to by writers on the subject.

Benjamin Robins, an English mathematician and all around scientist, who was born in 1707 and died in 1751, was the first person known to publish an explanation showing why spherical projectiles from smooth-bore guns describe a curve in their flight and why a rotating rifle ball progresses more reliably in the line of its vertical plane of fire. His discussion on "The Nature and Advantage of Rifle-Barrel Pieces," published in July, 1747, embraced all the knowledge on the subject at that time. Beyond his contributions to the scientific information of the civilized world, mankind is his profound debtor for his memorable defense of Sir Isaac Newton's immortal discoveries in the realm of physical research.

Two most important advantages of the spirally grooved rifle over the smooth-bore gun are:

First. The rifling imparts to the projectile a lateral rotation on its longer axis, the direction of which can always be foreseen and the continuance of which is scientifically dependable.

Second. It enables the employment of a projectile which exposes to the atmosphere in its front a much smaller area of resistance to the atmosphere than is exposed by a spherical projectile of the same weight. This diminished area of air resistance in proportion to

FIGURE 2

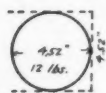


FIGURE 3

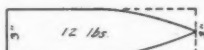
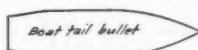


FIGURE 4



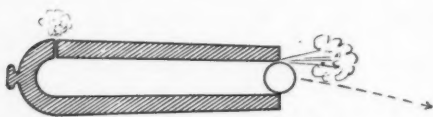
Showing difference in area of obstruction by air in front of projectile

weight is the essential element of its greater range, thus:—(Figs. 2 and 3).

A rifle projectile keeps its point in front during its flight because it is controlled by the same principle of gyration that maintains a spinning top upright on its peg, namely, that as fast as any part of it tends to fall that part is instantaneously turned away so that it is on the upper side, and this continues so long as the projectile revolves with sufficient rapidity to keep gravity from acting dominantly at any separate point of it. A bullet from the present Service rifle revolves about 3,240 times a second as it is departing from the muzzle of the gun.

A spherical projectile, in all probability, never has its center of gravity and its geometrical center coincident. Few or none of such projectiles are homogeneous in density. Hence the force of the explosion behind them does not act uniformly upon the whole of

FIGURE 5



Bird's eye aspect of curving cannon ball.

their cross section, and consequently it imparts to them a quasi bouncing motion along the bore as the bore of a muzzle loading, smooth-bore, large caliber gun must of necessity be larger than the ball to permit the spherical ball to be readily placed in it. As the ball wabbling from side to side of the bore, at last arrives at the muzzle it impinges against the bore at some point which acts as a pivot while the gases of the exploding powder, passing out between the ball and the bore where they are not in contact, impart a whirling motion to the ball just as a baseball pitcher gives a revolving motion to a baseball by holding it tightly at one point with his finger ends and leaving the opposite side free. The phenomenon may be illustrated thus:—(Figure 5).

Even though the spherical bullets of small smooth-bore guns should fit tightly in the bore, the lack of uniformity in the cross sectional impulse from behind imparts some degree of movement around the center of grav-

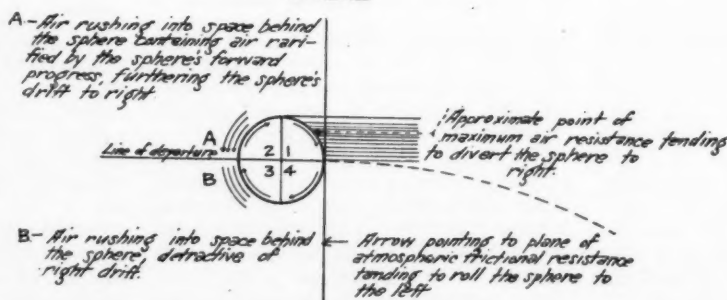
It is, of course, imaginable that a spherical projectile might be so constructed that its geometrical center would coincide with its center of gravity, and that it would pass along the entire length of the bore of the gun with the geometrical center coincident with the center

of the bore and consequently never touch the sides of the bore; also that, regardless of the influence of air currents or differences in air density, after the projectile should be discharged from the gun it would maintain during its entire flight the same attitude with relation to the line of departure that it did at the beginning of its flight. It would not be feasible in practice to give effect to such a conception, and it would not delay the disuse of the smooth bore as an arm of range and precision, if it should, if for no other reason than that the atmospheric opposition to the flight of a sphere is much greater than the atmospheric opposition to the flight of an elongated rifle projectile of the same weight.

It was for centuries and until recently a subject of speculation whether the long axis of a rifle projectile in flight continues parallel to its trajectory, as the line of its flight is called, especially during the distinctly curved portions of its course; but it has recently been shown by photography that rifle projectiles proceed point first in flight. One effect of the following discussion is to demonstrate, by the tendency of such projectiles to drift from the vertical plane of their departure from the muzzle of the gun,

FIGURE 7

BIRDSEYE VIEW OF DRIFTING SPHERE



Showing why course of rotating spheres is curved.

ity of the projectile and inequalities in the density of the air in which it may be moving and currents of such air cause a more or less erratic flight.

that their long axes soon assume and thereafter continue substantially parallel to their trajectory, and that they accordingly invariably strike in that attitude on their points, at the end of their flight, if the range is beyond the left drift period and if sufficient rotation on their long axes is imparted and maintained.

DRIFT

Drift as applied to firearms is the lateral diversion of a progressing projectile either to the right or to the left of its plane of fire, as the vertical parabola or curve described by its line of flight as it departs from the gun is technically termed. It is due to greater air pressure or resistance on one quadrant of the surface of the projectile than on the other

FIGURE 6



quadrants of that surface. This greater air pressure forces the projectile away from the point where that predominant pressure is applied.

According to the War Department publication hereinbefore cited, left-hand drift of our old flat based infantry rifle projectile increases from approximately .25 of an inch at the end of 100 yards to .45 of an inch at 300 yards from the muzzle of the rifle, and thence gradually diminishes until approximately 500 yards is reached, at which point the tendency to right-hand drift has begun, and that drift increases from .55 of an inch at 600 yards to about ten feet at 3,100 yards from the muzzle. (See Figure 6.)

THE PHILOSOPHY OF DRIFT

The laterally curved trajectory of a rotating baseball or spherical cannon ball in flight is the most familiar illustration of progressing projectiles diverted from a direct line of flight or line of departure by the influence of unequal air resistance on the surface of the different quadrants of their lateral cross sections. This diversion may be graphically illustrated by the following diagram which is a circle, divided into quadrants, representing a birdseye view of a cross section of a baseball or of a spherical cannon ball in flight, rotating laterally, and showing the quadrant whose surface is affected by the greatest air pressure and friction, the resistance of which is diverting the line of flight of the sphere into a curve by gradually compelling the sphere to seek a less obstructed course than its line of departure. (See Figure 7.)

The air pressure or resistance on the outer surface of the arc of the upper right-hand quadrant, numbered 1, of Fig. 7, is greater than at any other portion of the surface of the circumference of the circle, because, in addi-

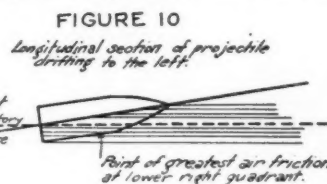
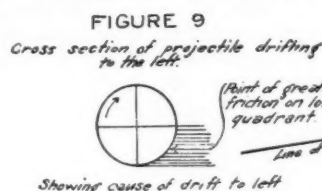
tion to the direct resistance of the air immediately in front of that arc, the surface of that arc is subjected to greater friction with the resisting air as an incident of its rotation in the direction of the line of flight of the progressing sphere whose section the diagram represents. The surface of the arc of the lower right hand quadrant (number four) is moving curvilinearly backward with respect to the line of flight and consequently diminishing the air pressure and air friction at that point. The surface of the arc of the lower left-hand quadrant (No. 3) is moving curvilinearly backward from and across the line of flight, in a comparative vacuum, and thus diminishing both air friction and air pressure there to a practically negligible degree. The surface of the area of the upper left-hand quadrant (No. 2) is moving curvilinearly across and in the direction of the line of flight, but in a space occupied by air whose extreme tenuity, due to the forward flight of the ball, very largely relieves that surface from both air pressure and air friction. Hence the most appreciable obstruction to the direct forward flight of the ball is the disproportionate air pressure upon the surface of the arc of the upper right-hand quadrant, and the friction of the extreme front of the circumference of the circle with the air immediately

in the opposite direction to the movement of the surface of that quadrant. The result of this frictional excess is a further influence in forcing the sphere to the right.

Of course, where the rotation of the sphere is from left to right the direction of its drift is accordingly reversed.

RIFLE PROJECTILE IS A MODIFIED CYLINDER

If a circle divided into quadrants be considered as the lateral section of a cylinder, it will serve to illustrate, graphically, the phenomenon of drift or the deflection of progressing rifle projectiles from their initial direction or vertical plane of departure;

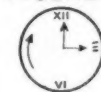


as such projectiles are modified cylinders.

DIRECTION OF ROTATION

When the rifle projectiles in the military Services of the United States are ejected from the gun, they rotate laterally in the direction pursued by the hands of a clock: Fig. 8.

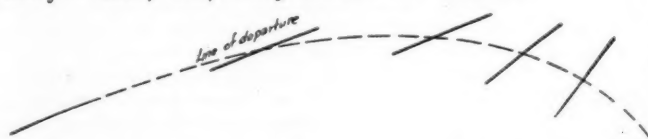
FIGURE 8



LEFT-HAND DRIFT

As a projectile discharged from a modern rifle, and rotating on its longer axis in the direction pursued by the hands of a clock, progresses through the air at ranges of

FIGURE 11
Flight of homogeneous arrow.
Showing its tendency to keep its long axis in its line of departure.



in front of that point, incident to the rotation of that circumference to the right which tends to deflect the circle to the left, just as it would roll if the air at that point were a rigid plane surface. The resultant of the friction and pressure or crowding of the air on the surface of quadrant 1, minus the friction of the extreme forward point of the circumference of the circle with the air in its front, is the impulse which compels the ball to take the path of least resistance and diverts its forward course from the line of departure, into a curve.

There is also a comprehensible frictional influence upon the surface of the quadrants 2 and 3, due to the rushing of the air into the rarified air space immediately behind them incidental to the forward progress of the progress of the sphere.

This air friction against the surface of quadrant 3 is minimized by the rotation of the surface of that quadrant in the same direction in which the inrushing air is moving, while the air friction upon the surface of quadrant 2 is increased by the movement of the inrushing air

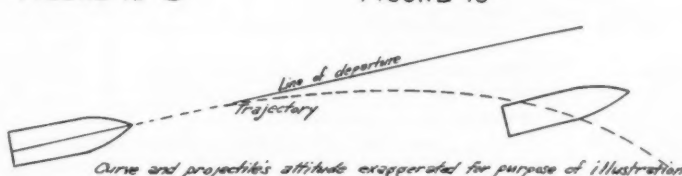
about 450 yards or less, it is forced from the initial direction of its flight, and toward the left of that direction when fired at low angles of elevation. The left drift of projectiles fired at high angles of elevation is discussed at length farther on in this article. Wherever high angles of elevation are not specified the reference is always to low angle ranges.

With sights set for from 450 to 500 yards, the major axis of a projectile rotating about

FIGURE 12



FIGURE 13



that axis maintains for the longer part of that range an attitude oblique to the arc of the trajectory and pointing above that arc, whether that axis is an angle to or parallel with the horizontal.

During either of such attitudes of that axis, the surface of the lower right-hand quadrant of the projectiles is exposed to an air pressure

ure and the incidental air friction therefrom greater than the air pressure and air friction on the surface of either of the upper quadrants or the surface of the lower left-hand quadrant.

When the axis is horizontal, the mere vertical falling of the projectile progressing obliquely to the trajectory incurs a greater pressure of air on the lower right-hand quadrant and correspondingly greater friction.

The greater density of the atmosphere at the lower side of the projectile is also an element of the greater air friction there, but so slight an influence as to be practically merely theoretical. Each of these elements of drift diversion is very small and the resulting deflection or drift of the projectile

at the ranges mentioned correspondingly slight; but they are sufficient to cause an appreciable deflection to the left. The induced air current which impinges upon the lower quadrants also contributes to the forcing of the base of the projectile to parallelism with the trajectory on the principle by which a string attached to a stone in flight follows the stone's trajectory.

The long axis of an arrow constructed of uniform shape, size and weight along its entire length will, when the arrow projected from a bow is in flight, maintain substantially the same relation to the trajectory that is acquired at the moment of its departure from the bow until it loses so much of its momentum that the attitude of its long axis to its line of flight becomes erratic from unequal atmospheric resistance and from the influence of gravity. (See Figure 11.)

A similar but minor phenomenon attends the flight of rifle projectiles during the portion of their flight in which their mass is diverted to the left of the plane of fire, except that so long as their rotation on their long axes persists their points keep in front.

The drifting to the left is not the capricious effect of a mechanical incident such as a lateral jolt of the muzzle of the gun in that direction, or the rush of gases past the right-hand side of the shot, to which some writers on the subject ascribe left drift, but is an inherent and constant consequence of the greater air pressure and friction on the surface of the lower right-hand quadrant than on the surface of the upper quadrants and lower left-hand quadrant, as shown on Figures 9 and 10.

Since under varying conditions either the "jump of the barrel" or the "rush of gases" may take effect with varying degrees of violence, anywhere on the circumference of the muzzle, and thus cause wide variations in both the direction and extent of the diversion of projectiles, those influences cannot philosophically be considered as the cause of any drift phenomenon.

Sometimes at ranges of about 450 yards or less, with the sights set for the 500-yard range, the hole made by the bullet from the standard

infantry rifle will be slightly oblong, with its long axis vertical, as per Fig. 12, showing that the projectile struck the target with its long axis angular to it. Figure 13 is an exaggerated illustration of that angular attitude of the projectile, but it might be accurately depicted by photography.

But it is not necessary for the vindication of the claim to demonstrate or assert such a posture of the projectile, as the falling of the rotating projectile from the influence of gravity with its long axis horizontal causes a greater air pressure and consequent friction on the surface of its lower quadrants than on the upper ones where there is a corresponding tenuity due to that falling.

RIGHT-HAND DRIFT

At ranges exceeding 500 yards the lateral deflection of infantry rifle projectiles is toward the right. In these flights the trajectory is much more vertically curved than at the shorter ranges. With the sights set for a range of 600 yards, the summit of this curve is more than three feet above the line of sight. With the sights set for the 3,100-yard range, its maximum height is reached at 1,900 yards, and is approximately 570 feet or 190 yards above that line. The air pressure on the left upper quadrant due to the rising of the projectiles, especially the curvilinear rise of the rear portion of the projectiles, in attaining these summits, and the curvilinear course of the same part of projectiles during their declination from the summit are the essential causes of their deflection to the right. (See Figure 14.) This ascent during the right drift part of the flight exposes the surface of the upper half of the projectile to an atmospheric pressure equivalent to a descending air current of about a mile and three-quarters a minute, in addition to the air pressure on that surface from the direction toward which the projectile is moving, which directly opposes the bullet's forward flight. This rise of the bullet also lessens the air pressure and friction of the surface of the lower half of the lateral surface of the projectile, by causing a partial vacuum there. (See Figure 14.)

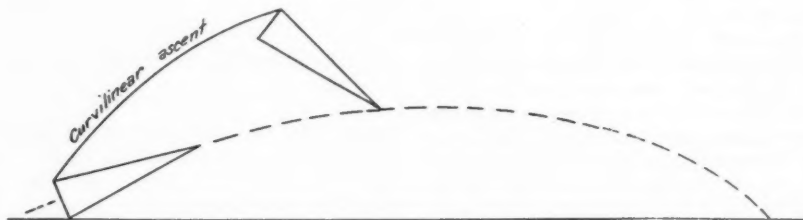
more effective action of gravitation there while the rear portion is without that opposition, so that the momentum it receives in common with the rest of the projectile urges and maintains it more nearly and strongly in the line of departure. See Fig. 15 for graphic illustration of the principle. But while the rear portion of a rifle projectile ascends more rapidly than the front, the point is kept forward by the nutation of the projectile on its long axis incident to the rotation imparted to the projectile by the rifling of the gun, in accordance with the well understood principle already described.

That the rear end of the projectile rises in a curvilinear course as a component of its trajectory during the right drift portion of its flight, until the projectile reaches the summit of the trajectory, is obvious from the

ing forward than the velocity with which it is falling. As hereinbefore stated, with sight elevation for a range of 3,100 yards, the summit is reached at 1,900 yards, which leaves 1,200 yards for the projectile to proceed forward while it is falling approximately 190 yards or 570 feet. (See Figure 14.) Hence the air pressure on the forward or upper surface of the projectile is several times as great as that which the falling of the projectile induces on the lower aspect, or would even if the air impinging upon that surface of the projectile were not rarefied by being substantially in the wake of the short angular axis of the projectile.

As the projectile continues to decline its longer axis assumes a correspondingly greater angle to the horizontal, and its upper aspect to present an attitude more nearly vertical

FIGURE 15



fact that the long axis of the projectile at departure for long ranges is at an angle to the horizon, while at the summit of the trajectory it is parallel to it.

With the sights set for the 3,100-yard range, the attitude of the long axis of the projectile to the trajectory changes at right drift ranges, by the curvilinear rise of its rear portion, from an angle of several degrees at the muzzle to a horizontal position at the summit of the trajectory. (See Figure 14.) In effecting this change of attitude an amount of force is expended which is sufficient to induce the degree of friction on the upper quadrants of the lateral surface of the projectile needful to divert it to the right in accordance with the principles illustrated in the description of the

to the line of its forward progress, which correspondingly subjects that aspect to an increased air pressure or resistance and conduces to increase the air friction on the surface of the upper quadrants and consequently maintain the drift of the projectile to the right, notwithstanding the diminution in the speed of its axial rotation and in the speed of its forward flight. As that angle increases, the angle of the lower or rear surface correspondingly increases, which lessens the exposure of that surface to the air resistance and air friction induced by the vertical fall, and conduces to the tenuity of the air at that surface. (See Figure 14.)

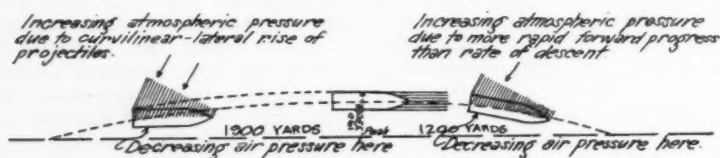
The reasoning upon which the foregoing deduction is based is confirmed by the following statement in the issue in the August, 1924 edition of the *Scientific American*, by Mr. Albert G. Ingalls, of the Army Proving Ground at Aberdeen, Maryland:

"Here at the proving ground we have watched projectiles, at high angles of elevation, drift toward the right and after passing the summit of the trajectory come back toward the left, falling further to the left than they ever went to the right of the plane of fire. With normal shapes of projectiles, the drift with right-hand twist rifling passes from the right to the left of the line of fire when the angle of elevation is 67° or 68°."

The practice mentioned in that quotation fully establishes, experimentally, the principle illustrated by Fig. 14, namely, that the lateral diversion of a rifle projectile during the falling branch of its flight depends upon the relation between the extent of its forward progress during that branch and the distance it is falling vertically. When a rifle projectile during the falling

(Continued on Page 16)

FIGURE 14



If the rear portion of the progressing projectile during its rising branch were not also concurrently rising curvilinearly more rapidly than the front portion the air pressure would be substantially uniform on all portions of the surface of the projectile parallel to its long axis and there would be no appreciable drift to the right during the ascent of the projectile to the apex of its trajectory.

This curvilinear ascent of the rear portion of the projectile is due to the greater opposition of the atmosphere in the front of the projectile which retards that portion more than the rear portion, thus facilitating the

phenomenon of the curving baseball. Figures 7 and 8 should constantly be borne in mind in the consideration of this study.

When a progressing rifle projectile passes the summit of its trajectory, with sight elevations for ranges where the distance from that summit is greater than the elevation of that summit, the exposure of the surfaces of its lower or rearward quadrants to a corresponding increase of air pressure in consequence of its falling is neutralized, essentially, by the rarefaction of the air at that aspect of the projectile that is caused by the greater velocity with which the projectile is proceed-

"So This Is Lima!"

By Captain Edward C. Crossman

RIGHT side up and in the best of condition the United States Pan-American Rifle Team reached Lima, Peru, November 11th on the good ship Santa Luisa of the Grace Line. There were no casualties en route outside of the fact that Ensign A. M. Morgan, of the Navy, got seasick off Hatteras and Bud Fisher, *El Campion del Mundo*, had a sore elbow probably from bending it so often out in the smoking room of the ship.

The Santa Luisa rescued from the ancient caravel, Kroonland, at Panama, the party writing this story in the palatial Hotel Maury in Lima, but outside of this no untoward incident marred the trip.

The Santa Luisa was met at the outer anchorage of that ancient seaport of Callao, known to all sailormen Callee-o and to the Spanish as Cayao, by an official launch bearing divers officials from the Peruvian government including Commandante Hector Cavallos, subdirector of the Peruvian national rifle shooting game; Capt. Teofilo Bellido, who has been the team's guardian ever since, and other high officials of the Peruvian rifle shooting and army organization. After seeing quite a little of Callao—on foot—and some more of Lima after a ride on the Lima-Callao rattler covering the seven miles intervening, the team was finally installed by dint of a shoe horn and much argument in accommodations reserved for eight men instead of eleven. Their present hangout after working hours is the Grand Hotel Maury, the epithet showing that the Spanish are apt to exaggerate now and then in their descriptions.

However the boys are very comfortably fixed up, there being a bath connected with each room—by a hundred feet of hall—and each room having running water which runs out of the pitcher whenever it is tipped up and as long as the bottom remains wet. They are not a very dirty crowd, naturally, but after all hands went out and viewed the bathtubs they decided to vote the straight Italian ticket which consists in being sewed up in one's underwear until spring.

The team decided to go out to the range the day after arrival, there being but three days left for practice and to get used to Peru. They changed their minds however, the next day being put in extensively in calling on people who were not remotely interested in the team, and in whom the team were equally interested, the list including the Minister of War, the American ambassador, Senator Poin-dexter, and Colonel Manuel Ponce. Colonel Ponce did prove very interesting, however, on better acquaintance, being the head of Peruvian rifle practice, and equivalent to our Director of Civilian Marksmanship, except that his duties are rather more varied than is the case in dealing with our own civilian riflemen.

The American ambassador was much interested in Ensign Morgan, who explained at the

request of the Senator, why the Argentine team defeated the Navy at Wakefield this fall, "Navy's" explanation boiling down to the elementary fact that the Argentinos hit the center of the black spot with more pleasing regularity.

During Navy's recital Bud Fisher was observed looking furtively around for an ash tray and finally dropped the ashes into his coat pocket after which a violent scent of burning wool pervaded the holy atmosphere of the scene.

Thursday, the 13th, the team finally got out to the range only to have a violently agitated Peruvian captain descend on it at eleven o'clock with the news that the president of the Republic would receive the teams at 12 o'clock. Wherefore was a violent scurry back to the hotel, and a shift into dress clothes and then a solemn procession with the various outfits over to the palace a few blocks away.

Here ensconced in the great and impressive throne room of the viceroys with the great red throne on its raised dais under its red canopy the teams were greeted by a slight and old gentleman with white hair and moustache, and a cold and piercing eye, the president, and by far the best one Peru has ever had.

Friday and Saturday, the 14th and 15th, the team got in some real practice, the chief feature of which was the excellent shooting done after the long 12-day sea voyage, and lack of practice.

The matches opened Sunday, the 16th.

The range lies northwest of the city, about 15 minutes' wild jitney ride from the center of the town. It is located in a pocket of the barest, most forbidding looking hills that ever existed outside of Lower California or the Sahara, which is true of every mountain we have seen in Peru. It is quite level, however, bordered by the eternal Peruvian mud walls on either side, and with a nice patch of string beans, onions and other Peruvian fruit between the firing point and the targets.

The team found a firing point built up on a raised mound about 12 feet wide, with 25 targets ready to fire on. The firing points are covered, with partitions, but without floor and open front and rear so the wind blows cheerfully right through them. There is no building, merely a long roof and some partitions or booths. Much to the relief of all hands who have played this international stuff, there were no benches to shoot from, and good honest Peruvian earth to get down on in the prone position.

The boys looked over the town more or less in the few days after their arrival, advised and at times guided by the big and good looking Captain Stewart, General Staff, our military attache at Lima, and Mr. Holmes, local representative of the Winchester Company, who has been invaluable to the team since its

arrival. (Bridgeport papers please copy.) Most of them have been down to call on Mr. F. Pizarro who holds forth in the great cathedral about a block from the hotel. Mr. Pizarro is dead, quite dead in fact, and has been so for about 400 years which seems to settle the matter. His chief attendant unlocks a grill protecting one of the elaborate "stations" of the cathedral, lights a candle, lifts up a cloth covering a glass case on a marble slab, and there you behold Hon. Pizarro stretched out on a red plush bier, as naked as the day he was born, but much older. I don't know whether you would class the remains as a skeleton or a mummy but it gives the North American kind of a shock to push his nose up against the glass and behold the withered body and grinning skull a few inches away of the man who conquered two thousand miles of territory and a few million Indians with his handful of hard boiled Spanish. The American is not quite accustomed to seeing the George Washington of a country stretched out in his bareness for the curious inspection of the cursory visitor who wants to examine into the details of his chassis. The sword wounds that let out the life of the indomitable, ruthless and treacherous Conquistador are still visible in the chest.

Thus far the stay of the team has been one round of wild excitement and entertainment. Tuesday night the team had dinner at the hotel, strayed mournfully around the deserted Lima streets and then went to bed.

Wednesday night saw another such wild party.

Thursday night, ditto.

Friday night, *lo mismo*.

Saturday night, the same.

Sunday night, *otro vez*.

Thus far the assiduous search of the most skilled team scouts has failed to unearth anything in Lima that is open after nine o'clock except the plaza and the entrance to the hotel. The team is tired of both. There is not, unless carefully hidden from the stranger, a single night life restaurant, cabaret, good show, bad show, medium show or anything else that would serve to take one's mind off the shoot or help pass away the evening.

There are rumors of a bullfight on the 23rd for which the team has bought tickets, and intends to go over and cheer on the bull.

Lima is the City of Mud. Two days good California rain would wash the whole town into a heap of earth. It never rains here, which is too bad, and as a result the houses are built of plain adobe, which is mud in plain English. Even the roofs are flat and of mud. The *palacio*, built by Pizarro, looks very impressive but every time one of the wild-eyed Ford drivers who infest the streets, knocks a corner off said *palacio*, the adobe shows up underneath like a red flannel shirt from underneath a dickey.

Lima streets in the downtown district are about 20 feet wide from walk to walk, the walks themselves being four to five feet wide. One can cross a Lima street in seven steps. I have myself gone from the middle to the sidewalk in two, but this was under duress and not to be taken as a scientific measurement.

Up and down these boulevards course the craziest motor car drivers in the world, driving mostly Fords, but with a sample of every car in the world in the jam. Every now and then two of these chariots come together with an awful crash, whereupon the drivers, the passengers, all the bystanders and the traffic cops from three block around get together and all talk at once at the tops of their voices. A machine gun barrage would sound like the gentle burbling of a brook in comparison. A half hour later they will still be there, I know because I timed one such party, which blocked the principal streets for seven blocks in either direction. Nobody minded because the drivers of the held up cars got out and joined the debate as fast as they got within arm waving distance. She's a great old town, and the ordinary necessities and luxuries of life cost only twice what they do in the States.

If they would put their traffic cops, figure-heads about as useful as a lot of wooden cigar store Indians, their lottery sellers and a lot of their soldiers, to honest labor, they could shovel a path through the Andes and bring the Amazon over to water Peru.

The road to the range passes through a flat roofed collection of mud houses that has apparently not changed since the time George Washington spent the night in every other old house in New England. Then it turns north and runs between mud walled fields for a half mile and turns down a pretty tree-lined drive to the Poligono San Jeronimo, *poligono* being Spanish for rifle range.

At the range, which is the regular Lima army site for soldiers and civilian rifle practice, there is a pavilion, a two story building with rooms below, and an open air deck above where the teams are provided with lunch each to save the trip into the city.

The range for the special match at 400, 500 and 600 meters for the Peruvian Cup Team Match, 15 shots per man per range, is not finished at the present writing, but is under construction. As there are no individual prizes the team is not worrying any as the team shoot is not due until the 27th. This is an event in addition to the Pan-American Team Match.

The American outfit has entered the pistol events and the fine Lima shooting outfit, the International Revolver Club has undertaken to furnish the team with .38 S. & W. target revolvers, the only arms that can be used in the match with any chance of success.

Today—this yarn being written at midnight, Sunday night of the 16th—the individuals opened and the U. S. Team shot in three out of the four rifle events.

Navy Morgan opened the ball by knocking out a nice five-shot possible of 50—5 shots in the four-inch ten-ring at 328 yards—which caused much rejoicing among the foreign competitors. As this is in a three position match,

with five-shot re-entry strings, and the best ten in each position to count on the thirty

LATE NEWS FROM THE TEAM

IN order that they may participate in the concluding ceremonies of the Pan-American Matches, including the presentation of trophies, most of the members of the United States team will remain longer in Peru than at first contemplated, sailing for home on December 17.

How complete a "clean-up" was made by the United States team is to be gleaned from recent cables received by THE AMERICAN RIFLEMAN. Pending a complete report of the shooting from Capt. E. C. Crossman, whose first story from Lima appears herewith, the following official message from Capt. John H. Kneubel, of the United States team, gives a summary of the results of the competitions:

CABLEGRAM

From—Lima, Peru.
To— Gen. F. H. Phillips, Jr.,
1108 Woodward Bldg.,
Washington, D. C.

Scores and position of teams and individual matches fired are:

Peruvian team matches 400, 500, 600 meters, United States 1331, Cuba 1327, Peru 1289, Argentina 1278. Pan-American Matches Argentine Trophy United States 5123, Cuba 5048, Argentina 4934, Peru 4788. Visitors' Cup 300 meters re-entry rifles Fisher 282 winner, Coulter second, Crossman Monahan tie third. Carton Match Rehm 933, Vermette second, Monahan third. All qualified master rifle shots 300 meters small bull's-eye. Prone limited re-entry, Rehm 194, possible 200, Monahan 193 second, Vermette 189, Lloyd 188, Coulter 186. 300 meters three positions Martino Argentine winner, Hinds second, tie scores 286. Caliber .22 pistol match shot later. Champion Pan-American matches, Hinds 1034 meters. Position championships Arro Cuban 330 standing, Hinds 351 kneeling, Coulter 370 prone. Crossman, Monahan, Coulter, Fisher on Santa Luisa, remainder of team completing tour Namet sailing 17th.

(Signed) Kneubel.

Reference to a translation of the official program in connection with Captain Kneubel's cablegram shows these more detailed results:

International Rifle Match for the Argentine Silver Cup Trophy. Teams of five representing each nation; 40 shots each standing kneeling and prone at 300 meters on targets, round one meter in diameter divided into ten zones with a black bull approximately 24 inches in diameter, the black counting 5, 6, 7, 8, 9, 10. Match shot November 29. Possible score, 6000. Arms—the military rifle of the competing countries. Official results: United States 5123; Cuba 5048; Argentina 4934; Peru 4788.

Peruvian Trophy Match. Teams of six representing each nation; 15 shots for record each at 400, 500 and 600 meters, any position, on the Pan-American target. Match shot November 27. Possible score 1350. Official scores: United States 1331; Cuba 1327; Peru 1289; Argentina 1278.

shots total, Morgan has to back up his score by considerable other achievement to make it win anything for the Morgan children.

Sid Hinds distinguished himself by making more offhand than he did prone in one match, being alternately uplifted when he thinks about the offhand, and downcast when his mind turns to the prone matter.

Fisher is shooting back in the old form in spite of his trigger pull of about seven pounds instead of the set trigger of his free rifle. The idiotic restriction of the pull to not less than 5½ pounds works out on the Springfield to nearer seven than 5½, and the effort to pull out this weight is perfect agony in the offhand position. This 5½ pound thing is one little matter which the writer of this screed is going to endeavor to knock higher than the well known kite when the Pan-American Congress meets toward the end of the shoot, divers representatives of other teams now being interviewed to this end.

Hinds, Coulter, Fisher and Lloyd are the old wheel horses with Rehm, Morgan and Vermette showing bursts of speed, and Monahan shooting fine offhand and prone scores. Nobody knows who will make the final five men to shoot in the Pan-American, but the five who make it will know they were in a shooting match.

The Argentinos are here in force, with a neat and nifty shooting uniform—something the Americans need. They are using their Mausers with Lyman 48 sights and rumor has it, American barrels.

Peru is using 7.65 Mausers, as is the Argentine rifle, with American barrels, close chambered with short lead, Lyman sight and Remington 7.65 ammunition with 180-grain bullet and 2,800 feet velocity.

The Argentinos allege that all they have is their Government Argentine-made ammunition and that it will not perform. Their offhand scores are as good as their prone, which bears this out, but they have some American stuff on the way and it may arrive in time. They are doing better offhand than any other team on the grounds.

The Cubans have a good team in the match, using Springfields and Remington 180-grain stuff like the Americans. They are shooting fine prone scores, but not so good offhand.

Thus far there are only four teams in the match, Peru, United States, Argentina and Cuba. Columbia sent two officers who will fire in the individuals and Brazil sent two officers, armed with the Brazilian 7 mm. Mauser. More Argentinos are coming on the 19th, to shoot in the pistol team match.

It is the talk of the range that Cuba will be the next site of the Pan-American—1925—on the range near Havana. This is to be settled by the Congress at the end of the shoot but the sentiment is strongly that way.

The hard boiled citizens from the United States will hammer away this week and part of next in these individual matches, salting away, nailing down, and otherwise securing all or most of the individual prizes. On the 27th all friendship ceases, the same being the date of the Peruvian Cup Match at 400, 500 and 600 meters, 5 men, 15 shots at each range, targets about the same proportion as our "B." The 29th sees the big event, the Pan-American Team Match, at (Continued on Page 15)

Characteristic Pressure Curves of Shotgun Powders

By W. H. Coxe

THIS is a rather formidable title to be associated with the pleasant pastime of hunting or trapshooting. Yet a characteristic pressure curve is of vital importance in studying powders offered to sportsmen.

A motorist usually wants to know the characteristics and qualities of materials entering into the construction of a motor car before he buys it. Having once made his decision, however, he has no further concern with the technical details of construction, if he has chosen wisely; his interest centers on the pleasures of driving the car.

A somewhat similar condition exists with the sportsman, who spends considerable time and thought on the selection of a shotgun. Once the purchase is made, he puts the catalogs away and enjoys its use at the traps or in the field without further study. The gun, however, is only a part of the shooting game; it occupies somewhat the same position to the shooter as the chassis of an automobile does to the motorist. The chassis is useless without the engine. Motive power made the automobile possible. Likewise with shotguns, without motive power—or powder—these guns could not have progressed beyond the crossbow or air-gun stage.

It is to be regretted that so few followers of the shooting pastime understand or study the performance of powders to anywhere near the extent that motorists try to learn all about the motors of their cars and how they function.

It is difficult to differentiate between the performance of powders without becoming technical. A loaded shot shell, when fired in a shotgun, does its work in such a short interval of time that it is impracticable to draw a comparison with any other science, and for that reason it is necessary to study the performance of powders in the technical terms of the ballisticians.

The diagram on the next page shows characteristic pressure curves of the most prominent types of shotgun powders. The lower line of figures represents the first six inches of

For many years, the intelligent rifleman has given quite as much thought to the propellant in his cartridges as he has to the weapon he uses, realizing the vital relationship between powder and accuracy.

This has not been so markedly true with the scattergun enthusiast; therefore this discussion, the author of which is the ballistic engineer of one of the large powder companies, and eminently qualified in his field, is a significant commentary in a field which warrants the attention of every field or trap shot. Naturally in setting forth his conclusions Mr. Coxe has dealt with the powders produced by his company.—Editor.

the breech end of a shotgun barrel. The vertical line represents the pressure in long tons (2,240 pounds) that is developed by the various powders. The various curves show the path of the pressure at any distance from the breech, within the first six inches.

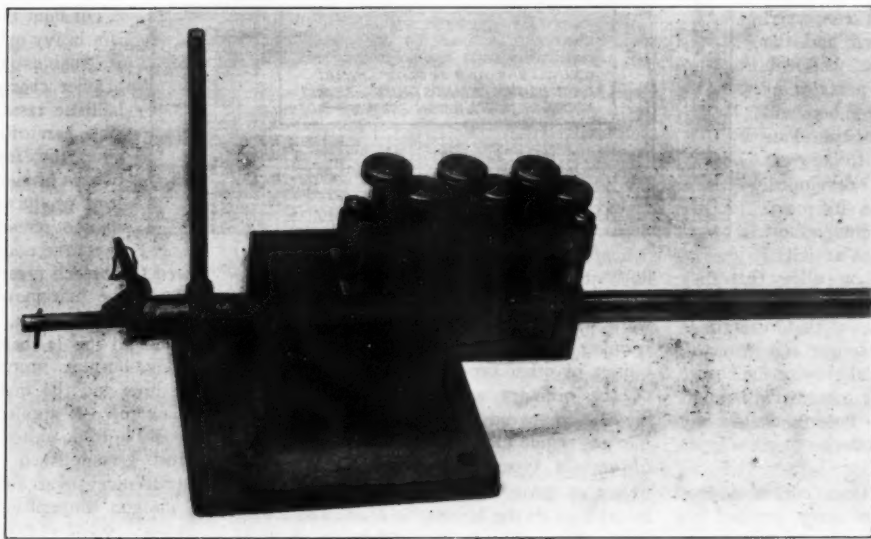
It is well known that different charges of shot and powder develop different velocities and pressures. So in a study of this kind it is necessary to load all powders in the same manner. In the test on which this diagram

made but as they perform in the same manner as du Pont Ballistite, Curve A can be considered truly representative of them all. You will note that Curve A rises very sharply from the zero point to the highest maximum pressure of any curve, and then falls off very rapidly; also that this maximum pressure is reached between zero and one inch of travel. After the maximum point is reached, the falling-off in pressure follows the progress of the shot charge down the barrel. This high pressure means that Ballistite starts the shot charge in motion with a very quick, powerful blow.

Curve B was developed with Schultze Powder, another du Pont product. This is a soft-grain bulk nitrocellulose powder. There are other powders of this type on the market, but they follow practically the same curve made by Schultze. Note here that the rise from zero to a maximum pressure occurs after the shot has moved a trifle farther down the barrel than was the case with Ballistite. This means that the blow with which the shot is started in motion is somewhat less severe than

Ballistite gives.

Curve C was developed by du Pont Smokeless. This is a bulk nitrocellulose powder and the only powder of this type with so hard a grain that it cannot be crushed when rubbed in the palm of the hand. Here the rise in pressure from zero to the maximum is not only a little slower than the others mentioned, but the maximum pressure is somewhat lower to obtain the same velocity. This means that if the powder were loaded to develop the same maximum pressure as Schultze, the resultant velocity would be



Multiple Pressure Gauge taking six readings at each shot.

was based, the powders were loaded with three drams—or the equivalent amount of powder to develop the same velocity—with one and one-fourth ounces of shot. This is a good average load. Heavier loads will develop higher pressures, and lighter loads, correspondingly lower pressures.

Curve A was obtained with Ballistite, a nitroglycerin powder made by the du Pont Company. There are other nitroglycerin powders

considerably higher.

Curve D represents Black Sporting Powder of FFFg granulation, which is representative of all types of black powder for shotgun use. It shows the most favorable relation of any powders discussed so far. It has a lower maximum pressure and gives a somewhat less severe blow to the shot as it starts the charge in motion.

Curve E was developed by using du Pont

Oval Smokeless, the latest development in shotgun powders. It is of the dense nitrocellulose type and is termed a progressive burning powder. A study of the diagram will show that in an equivalent load the rise in pressure from zero to the maximum is the slowest of all types of powders. But a more important feature is that the fall in pressure beyond the maximum point is less rapid than with any other powder. This means that du Pont Oval keeps on pushing the shot charge as it progresses down the barrel. To the layman this does not appear to be a departure of much consequence, but without this difference, it would have been impossible to make shotgun powder that would develop velocities higher than the older types of powder.

The question sometimes arises whether or not this progressive burning feature might prove dangerous in a shotgun. The answer is, compare Curves D and E. Note that black powder, Curve D, has very nearly the same slope as Du Pont Oval Smokeless, Curve E. It should be remembered, of course, that when du Pont Oval is used in maximum loads, the maximum pressure is considerably higher than that shown in Curve E; consequently, maximum loads should be used only in guns of superior quality and of approved strength. This, however, holds true not only of du Pont Oval, but of any powder which is loaded to a maximum pressure.

The shooter may well ask how such characteristic pressure curves are of interest to him. He is concerned only with the penetration and the pattern his gun and shot shell will produce. Penetration is a factor of velocity. Any powder listed here will develop satisfactory velocity. Patterns, however, depend to a great extent on the pressure developed. Any powder that reaches its maximum pressure in an extremely short time-interval will give such an initial blow to the charge of shot pellets that they will be deformed, developing poor patterns. On the other hand, a powder that rises to its maximum pressure in a longer time-interval, will give a less severe initial blow to the charge of shot pellets, and better patterns will result. Primarily, that is why du Pont Smokeless and du Pont Oval are so far superior to other types of shotgun powders.

But characteristic pressure curves do not tell the whole story, for every powder has its individual points of excellence, and it may not be amiss to mention some of them here.

Black Powder, from a ballistic standpoint, has always performed satisfactorily. It develops high velocities and good patterns with fairly low pressures. The principal objection to its use is the great amount of smoke it gives off and the heavy residue it leaves in the gun barrel.

Schultze Powder is incapable of developing very high velocities without correspondingly high pressures. It may therefore be considered a low-velocity powder, and as such,

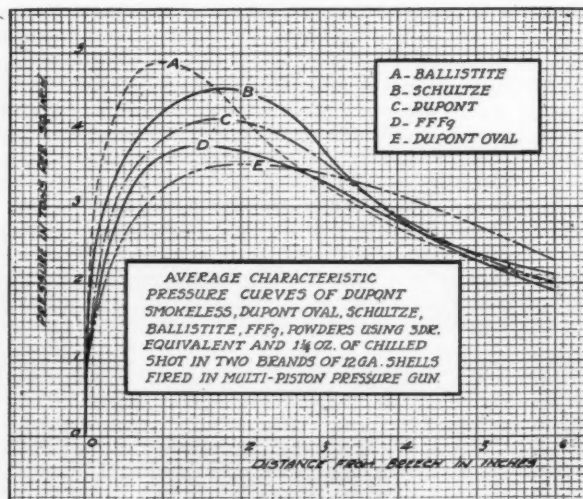
is very satisfactory for shooters who desire a load with a minimum amount of recoil. Incidentally, high velocities are usually accompanied with heavy recoil, irrespective of the powder used.

Dupont Smokeless has the widest useful range of any bulk shotgun powder. It is equally satisfactory for heavy loads or very light loads. It ranks second to du Pont Oval in the even pattern distribution it develops in heavy loads and is superior to all powders in medium and light loads.

Ballistite likewise has a wide useful range in all varieties of loads, but its quick-burning property makes it less suitable for heavy loads. Ballistite, however, is waterproof, and this valuable feature, to some shooters, offsets the slight loss in pattern.

Du Pont Oval can be used in a great variety of loads. Its chief point of superiority is in the very heavy loads. Here it surpasses all other types of powders in velocities, pressures and patterns.

These characteristic pressure curves do not



illustrate the field to which du Pont Oval is particularly adapted. To best understand the work which du Pont Oval is capable of performing, it might be well to study the capabilities of other types of powder. The work of the ordinary smokeless shotgun powder may be compared to the work of an automobile gas engine in relation to the needs of cars of various types ranging from the popular flivver up through the Chevrolet, Buick, Cadillac and on to the largest G. M. C. truck ever built. How difficult it would be to think of one type and size of engine performing satisfactory work for all kinds of cars so represented! But it is hardly less difficult to think of one shotgun powder as capable of meeting all the diverse requirements of sportsmen in the field. The largest guns they use are 10-gauge. The maximum load in this gauge is $4\frac{1}{2}$ drams of powder with $1\frac{1}{4}$ ounces of shot. The minimum load is $3\frac{1}{2}$ drams, $1\frac{1}{4}$ ounces of shot, and the minimum, $2\frac{3}{4}$ drams, 1 ounce shot. And finally, we

come to the little 28-gauge with its charge of $1\frac{3}{4}$ drams of powder and $\frac{3}{8}$ ounces of shot. Yet du Pont Smokeless, for thirty years, has lent itself to loading in these widely varying charges better than any other powder, and in reality has been the world's standard and universal powder.

Du Pont was not the pioneer in making the so-called progressive burning nitrocellulose military powder. The first powder of this type made abroad was decidedly inferior to the du Pont Improved Military Rifle type of progressive burning powder. The latter was developed after more than four years of intensive research work, to which has been added ten years of practical manufacturing experience which has resulted in still further improvement. However, du Pont was after all the pioneer in introducing progressive burning nitrocellulose powders in this country, but the powder introduced represented a new standard of achievement.

And now comes du Pont Oval. Out of the experience of the great war came additional skill in powder making. It was logical to apply these same principles to shotgun powders in an effort to improve the quality of shotgun ammunition. Experiments and tests made with du Pont No. 93 Rifle Powder in shotgun shells resulted in the perfection of du Pont Oval, the world's greatest heavy load shotgun powder and one that gives ballistic results and shooting efficiency not possible with any other powder.

Du Pont Oval, as made at present, is a heavy or maximum load powder. It enables the sportsman to use heavier charges of shot with better ballistic results than have been possible heretofore. Take the 12-gauge gun, for instance, in which $1\frac{1}{8}$ ounces of shot was the most efficient load produced, although $1\frac{1}{4}$ ounces of shot could be purchased. However, the additional $\frac{1}{8}$ -ounce of shot raised the breech pressure considerably, which lowered the margin of safety and adversely affected the pattern. With du Pont Oval powder all this is changed. Owing to its progressive-burning properties, its lower breech pressures and the manner in which the propelling force is applied to the shot charge, it is possible to do either one of two things never before accomplished, and each is a distinct improvement over anything produced before in shotgun ammunition.

First. With $1\frac{1}{4}$ ounces of shot, du Pont Oval gives the same ballistic results obtained with ordinary powders with $1\frac{1}{8}$ ounces of shot in 12-gauge loads. Here is a distinct gain of 11% in the amount of shot that can be used.

Second. With $1\frac{3}{8}$ ounces of shot du Pont Oval gives the same ballistic results obtained with ordinary powders with $1\frac{1}{4}$ ounces of shot in 12-gauge loads. This load is not standard in ammunition today, because of previous limitations of the powder, but should it be felt advisable or necessary to increase the maximum shot charge (Continued on Page 16)

The Model 1866 Winchester

By L. D. Satterlee

MR. D. WIGGINS in one of the sporting magazines some four years ago waxed enthusiastic about a Henry rifle with King's improvement loading at the breech, stating there was a specimen in the U. S. Cartridge Co's. collection at Washington stamped "New Haven Arms Co." The U. S. catalog, sad to relate however, is in error on this point, as this gun is not stamped that way at all, which is another instance of said catalog engaged in the gentle art of kidding the public. The gun in question is a Model 1866 Winchester, as it has a forestock, and is marked "Henry's Patent Oct. 16, 1860 King's Patent March 29, 1866." There is no serial number. I believe, however, the previous edition of the catalog, in which the guns are shown on a black background, states this model was made by the New Haven Arms Co. which may be true, inasmuch as this company continued until the latter part of 1866, while it seems that some of these improved Henry's (perhaps without forestock) were made in 1865. Cleveland mentions that he saw one at a target shoot in Washington, Con., in that year. If that is so, then the patent date March 29, 1866 would be omitted from the earliest specimens. Not so many people know, however, that the Winchester plant was in Bridgeport from 1866 to 1871, the office, however remained in New Haven. It may be, too, that the forestock models were not manufactured until after the firm settled in Bridgeport.

These improved Henry's were not called the Model 1866 until the Model 1873 came out, and those hardy frontiersmen who carried the new Winchester while guarding the building of the Union Pacific in 1869 probably referred to them simply as the "Winchester" or "Improved Henry." When the Model 1873 came out, however, the Winchester people were so pleased about it, that they thought they would not make any more of the 1866 model. Nevertheless, the demand for this model was such that they did assemble about a thousand carbines as late as 1891 (from parts previously made), and even some in 1896. These last took a center fire cartridge, similar to the .44 S. & W. American cartridge, so Mr. Wiggins is right when he says some of them were center fire.

The history of the development of the Winchester is extremely interesting, and as it is linked with the history of the Smith & Wesson firm, also a history of rim fire cartridges, the writer will go back to the beginning.

The Winchester is the lineal descendant of the Jennings rifle, patented December 25, 1849, which was the first practical tubular repeater made. This patent was an improvement on Walter Hunt's patent of August 21, 1849. R. S. Lawrence in his autobiography

printed in Professor Roe's "English and American Tool Builders," (1911) states the Jennings was made both as a single shot and as a repeater. The U. S. catalog shows two specimens, one being an improved model. The author's specimen is similar to the first one shown, having a percussion nipple. The serial number is 57, caliber .525 inch. The diameter of the tube underneath is about .40 inch, so



Oliver F. Winchester, founder of the Winchester Repeating Arms Company and Lieutenant Governor of the State of Connecticut during 1866 and 1867.

this tube must have held a ramrod, since it does not connect with the "insides" any way. Just how this worked is hard to say, as some poor benighted soul has bent the trigger guard in so that the trigger will not slide very far and some part of the mechanism is missing.

Walter Hunt, however, on August 10, 1848 (re-issued February 26, 1850) patented a cartridge in which the powder charge was contained in the ball, and as Horace Smith on August 26, 1851 had patented an improvement for the Jennings substituting a lever instead of the sliding trigger (the patent being assigned to Courtland Palmer), it is probable this improved model is the one, of which 5,000 were made by Robbins & Lawrence of Windsor, Vermont, about that time. If there were that many, there should be enough Jennings for every collector, but as it is these rifles are rather scarce. R. S. Lawrence states that Louis Kossuth, the Hungarian patriot, came to this country in the winter of 1850 (he arrived in New York December, 1851, however), ostensibly for the purpose of obtaining funds with which to purchase firearms. Courtland Palmer, being very anxious to show off the Jennings, telegraphed to Mr. Lawrence at Windsor, to bring the best rifle he had to New York City

and try it out, believing that if they could hit a target the size of a man ten times out of twenty-five at a distance of 500 yards, Louis Kossuth would purchase many. Accordingly a demonstration was held at Astoria, L. I. The gun however fouled badly, not one shot hitting the target. It was here that R. S. Lawrence hit upon the idea of lubricating the ball, and putting a few of the balls in a lathe, turned some grooves in them and put some tallow in the grooves. The gun shot well. Soon after, the Sharps ammunition was made that way, which solved the question of fouling for that arm. Whether Kossuth ever attended that demonstration, I have been unable to find out. Soon after he left for New Haven, and on April 23, 1852 received a present of twenty Whitney rifles from Eli Whitney, which no doubt were the Model 1841.

We then find Horace Smith working in 1852 for Allen, Brown & Luther in Worcester making rifle barrels, and there he met D. B. Wesson, where together the two worked on a repeating rifle and cartridge of slightly different design. A patent was taken out on February 14, 1854 for a repeating pistol, and on August 8, 1854 one for a cartridge improving upon that of Walter Hunt. On June 20, 1854 a partnership was formed between Smith & Wesson and Courtland Palmer, who had been proprietor of the Jennings rifle. A building was secured in Norwich and manufacture of repeating pistols was started. Some accounts say that rifles were also made, but none have been cataloged recently. Mr. Henry is probably in error in supposing that these Volcanic pistols were made for a period of about five years beginning with 1851. It seems more likely that the period was about a year. Whether Smith & Wesson made pistols before they joined with Courtland Palmer, I am unable to say. The pistols did not meet with a large sale, and in order to attract additional capital the Volcanic Repeating Arms Company was incorporated in July 1855. These two patents together with a subsequent one granted January 22, 1856 were turned into the new firm by Smith & Wesson. Mr. Smith, however, withdrew from the firm and returned to Springfield, joining with his brother-in-law, Mr. Collins. Some accounts say the two kept a livery stable, but others say they were gunsmiths. The latter is more probable. D. B. Wesson stayed on with the Volcanic being one of the incorporators and acting as superintendent. It was at this point that Mr. Winchester, who later gave the arm his name, became associated with the Volcanic. Of the 6,000 shares of stock subscribed by thirty-three persons, Mr. Winchester owned eighty shares. He had come to New Haven in 1848 and started a shirt factory at 59 Court Street, his residence being at No. 57 Court Street. In February, 1856 the firm moved to New Haven,

Mr. Wesson accompanying, occupying a building on Howard (now Audobon) Street which was later used by the Lindsay Firearms Company during the Civil War. The office was at No. 130 (now 344) Orange Street north of Grove Street, and just around the corner. On February 11, 1856 Mr. Wesson severed connections with the Volcanic Repeating Arms Company in order to devote his time to the development of a revolver pistol using cartridges.

Volcanic pistols were made in two calibers of about .31 and .38 and four lengths, about 9, 11½, 14½ and 23 inches long. The carbine was about 35 inches long, and weighed 5½ pounds, being much smaller than its successor the Henry rifle. Whether specimens of the Volcanic made at Norwich from June, 1855 to February, 1856 are stamped Smith & Wesson, Norwich, or Volcanic Repeating Arms Co., New Haven, I am unable to say.

In March 1857 the Volcanic became insolvent, so Mr. Winchester purchased the assets and incorporated on April 25, 1857 "The New Haven Arms Co." to which he turned over the assets by bill of sale dated May 1, 1857. This new firm continued the manufacture of pistols and carbines in the same building. Mr. Winchester, being president, had the office in his shirt factory at 59 Court Street. In June, 1859, however, the plant was moved into a new building at No. 9 Artizan Street, a short distance from the shirt factory. Both pistols and rifles were not such a huge success, as the powder charge was too small. Nevertheless, many were sold in foreign countries. There is an interesting article about them in *Leslies' Weekly* for October 9, 1858, page 291. When a squad of New York police went down to Staten Island to quell the Quarantine Riots, they had about eighty or ninety of the carbines and forty pistols. A good shot, it was said, could hit a dollar at eighty yards with one of the Navy pistols. The building at No. 9 Artizan Street is still standing, being occupied by the H. B. Ives Company, manufacturers of toys. Although the New Haven Arms Company had a patent for a flanged head, center fire, inside primed, metallic cartridge, they never made use of it, it remained for Mr. Wesson to develop a practical rim fire cartridge that could be used in the Volcanic.

It must be remembered that Mr. Wesson had left the Volcanic on February 11, 1856. The National Encyclopedia of American Biography (Vol. 10, p. 476) states that he went back to Springfield in May, 1856. This can hardly be true, except as a visit, as the testimony of himself and others in 1864 in the case of *Smith et al. vs. E. Allen et al.* shows that he was in New Haven as late at January 1, 1857, and that up to May 1 1857 he was still looking for a building in which to manufacture his revolvers. So New Haven can claim the honor for the development of the

S. & W. revolver. The New Haven directory for 1856 lists him at 18 William Street, and it is probable in a "little room" at this place that he worked on his revolver.

Mr. Wesson made three or four experimental pistols before he found one that was satisfactory. Mr. Wesson, however, used these French bullet breech caps (our familiar B. B. caps) which were an imported article. There are at least two sizes, No. 6 and No. 9. This means six to nine millimeters. Six millimeters however figures out to be .236 inch, but this may be a nominal figure. These "B. B. caps" were loaded with fulminate and were used in the Flobert pistol. The testimony of Jno. P. Lower, a clerk in the store of Jos. C. Grubb, of Philadelphia, showed that several had been imported in 1853 or 1854, but only



The Model 1866 Winchester introduced to supersede the Henry rifle. Caliber .44, rim fire.

two sold, and about eight were sent back to Belgium. The fulminate was rather powerful, and when Mr. Wesson tried them out in his first experimental revolver, the B. B. caps bulged back, against the recoil shield, preventing the rotation of the cylinder. Mr. Wesson next prepared a model in which there was a revolving plate between the cylinder and recoil shield. This however did not work any better than before. Mr. Wesson finally hit upon the idea of inclining the recoil shield to the cylinder so that the top of the recoil shield was nearer to the cylinder than at the bottom. When the BB caps bulged back they soon passed into clear space by means of the rotation of the cylinder. It was at this point (November 17, 1856) that he bought from Rollin White the right to the part of his patent of April 3, 1855 referring to the loading the cylinder at the rear.

Mr. Wesson had meanwhile hunted up his old partner Horace Smith and about May 1, 1857 they together leased a building in Springfield on Market Street, and started making the tools and parts for their revolver. By October 1857 they had some ready for sale. Mr. Wesson employed C. D. Leet, in the same building, to make these "BB" caps for his pistol. Mr. Leet also made Spencer and Sharps & Hankins cartridges during the Civil War. In 1867 he manufactured patent medicines, so it is probable his knowledge of chemistry had something to do with making cartridges. Mr. Wesson was dissatisfied with these BB caps swelling so much, and about March, 1858 hit upon the idea of putting the fulminate in the rim. In order to do that it was necessary to spin these cartridges in a machine, so that the fulminate would be thrown into the rim by centrifugal force. It will be seen, then, that the first S. & W. revolvers were .22 caliber, not because Mr. Wesson invented a rim fire when

the revolvers first came out, but because they used the French 6 mm. BB caps, used in the Flobert pistol. It is entirely possible that these BB caps were made in this country too.

Mr. McHenry is a little in error, however, in supposing that this first model revolver with the revolving recoil plate and hinged nose on hammer was made up to 1868. D. Wesson's testimony in 1864 in the case above mentioned says that only about 2,000 of this first model were ever made (the author's specimen is serial No. 2723), and that they were all finished by January, 1857, and that several months previous, i.e. about March, 1858, a new model had been prepared and tools started, omitting the revolving plate. So that it was the second model rather than the first that was extensively sold to the soldiers as pocket pistols during the Civil War. Also the .32 rim fire was first made in 1861, not 1865.

The instant success of the S. & W. revolver brought a flood of imitators, and both Rollin White and Smith & Wesson started suits in the old U. S. circuit courts against the infringers, the chief of whom was Ethan Allen. This famous lawsuit will have to form a separate article, however. The .22 rim fire paved the way for larger cartridges. Bliss, Gross and Bacon made revolvers for the .25 rim fire; Allen for the .30 and .32; Prescott for the .32 and .38; while Frank Wesson and Ballard came out with rifles using the .44 caliber rim fire.

B. Tyler Henry, who had been with Robbins & Lawrence when they were making the Jennings, and also had gone on with Smith & Wesson, also the Volcanic, adapted the Volcanic to use rim fire cartridges, patent for which was granted December 16, 1860. An entirely new model was made up, being much heavier, and called the Henry rifle. Henry rifles or carbines, as they are sometimes called, took the .44 Henry rim fire. These rifles were out as early as the fall of 1861. Cleveland in his "Hints to Rifleman" 1864, states that the Ballard, Wesson, and Henry all took the same cartridges, but as now made, anyway, the Henry is about .005 inch larger than the .44 long used in the Ballard and Wesson, so that these latter arms will not take the .44 Henry cartridge.

The Ordnance Department did not favor the Henry rifle, as the exposed spiral spring would collect dirt and leaves, while the tube surrounding it might easily be dented, stopping the cartridges from feeding into the chamber. The United States bought, therefore, only 1731 Henrys between July, 1863 and May, 1865; but individual States and some regiments bought to the number of 10,000, which was about all the firm could make. Two regiments acting as skirmishers in Sherman's march through Georgia were armed with Henrys.

Mr. Winchester was aware of the Ordnance Department criti- (Continued on Page 14)

The American Rifleman

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By The National Rifle Association



LIGHT INFANTRY 1776

In every war wherein the United States has been a combatant—except the World War—special uniforms have distinguished certain contingents and many Light Infantry units fighting with the Continental forces in 1776 wore shako plates bearing the motto "Liberty or Death." Among them were the Governor of Connecticut Foot Guards.

IT is a peculiar fact that the National Guard, which—from the standpoint of volume at least—is the greatest shooting organization in the United States, provides less active support for the parent shooting organization of the United States than do the unorganized civilian riflemen. A familiar query is:

"Why should I join the N. R. A.?"

The National Guard and the N. R. A.

The government gives me a rifle, furnishes the ammunition, supplies a range, provides for instruction and

pays my way to the National Matches."

From a superficial viewpoint, a more complete summing up of reasons for not supporting the National Rifle Association could not be found. Consider these facts however.

The National Rifle Association was responsible for the creation of the War Department board known as the National Board for the Promotion of Rifle Practice.

The N. R. A. and this Board were the impelling forces behind the origination of the National Rifle Matches.

The N. R. A. since 1871 has stood sponsor for every American international rifle team that has competed at home or abroad in matches representing world's titles with the rifle.

The N. R. A. and the National Board have stepped into the breach time after time and prevented the *abolishment* of the National Matches.

The present high state of development of the Springfield rifle and ammunition is due to the untiring efforts of the N. R. A. to see that more accurate weapons and ammunition are provided our fighting men.

The development of the new .22 Springfield, now being made up for issue was the work of the N. R. A., when Springfield Armory was without funds to operate, the National Board caused to be provided the funds for the development and construction of this new gun which will, in the next year, prove such an important training weapon for National Guard units.

The N. R. A. is responsible for building up the system of postal and telegraphic gallery competitions which permit the company commander to lift his gallery practice out of the class

of "just shooting" into the realm of real matches against units in all parts of the United States.

By organizing civilians into rifle clubs and filling them with a desire to shoot, by organizing high school clubs and instilling in the youngsters the love of the rifle, and by stimulating college shooting the N. R. A. opens up a fertile recruiting field among certified American citizens from which the National Guard has drawn and will continue to draw many of its most desirable recruits, and some excellent officers. These are some of the facts that are overlooked by the average Guardsman. There are others which will occur to you.

The N. R. A. stands ready at all times to serve as a clearing house for challenges from one National Guard outfit to another, to serve as arbiter in scoring targets where a close decision is required, in giving publicity through the columns of its official publication, *THE AMERICAN RIFLEMAN*, to all National Guard shooting activities and to assist in every possible way in the organization of state rifle organizations and the shooting of state competitions.

The sale of National Match grade Springfield rifles and ammunition to members of the Association without the delay incident to red tape methods, the sale of .22 caliber ammunition at reduced prices, and of various other shooting equipment is a real service to every Guardsman actively in the shooting game.

The National Guard receives its support in this work from the government—as it should. The N. R. A., however, is absolutely dependent on the support of those citizens of the United States who believe that a nation trained in the use of arms is the least likely to be called on to use its arms on the field of battle.

In going before the Congress and the country at large with its request and suggestions, as it has to do each year, the united support of the National Guard plus the established prestige of the N. R. A. can be made a powerful influence. It is to be hoped that during 1925 these two allied organizations can be brought more closely together and that the N. R. A. will have the support, active as well as moral, of every officer and enlisted man in the country who believes that its work is well worth while.

Who Will Be Regulated Next?

(Concluded from Page 1)

rage, if he couldn't deprive them of what they consider a joy in life, there wouldn't be one darned thing in the whole enticing game of being a fanatic.

We are enjoying a threat of anti-pistol legislation now because there were too many big sticks in the tobacco bundle. Once prohibition was an accomplished fact through Constitutional amendment, the next thing in line was tobacco. Cigarettes were selected as the weakest stick. Cigarettes were smoked mostly by boys and soldiers; they couldn't put up much of a fight. They did though, for the older lads who enjoyed a pipe or cigar could see what was coming. The tobacco users were too strong, and that fight was deferred temporarily. What was left? Plenty of things were left. Right at hand they had firearms and the class devoted to their use. Firearms were a fit game and a logical game. Guns had done much harm in the world. They had killed people and were not used in heaven. Besides, this anti-firearms program looked like a winning fight in the end. Once we were a nation of riflemen, and any threat of depriving us of the use of our guns would have brought—a horse laugh. But today one-half of all the men and nine-tenths of all the women do not know or care anything about a gun. If all these people who are now indifferent could be persuaded to become active in their opposition to firearms the fight was won. Remember that women can vote and they are easily persuaded. The Constitution might stand in the way, but amending the Constitution is only another diversion.

Why should the pistol be the weak stick in the firearms bundle? Because fewer men are devoted to its use; because crimes are committed with it; because it is not a major weapon in war—all resulting in a weak line of defense. Suppose we grant that not much harm would result if the pistol were entirely done away with—no more made, no more sold, no more used. Would that stop the fight on firearms? Anybody ever see a wrestler give up a match just when he had secured a strangle hold?

If the shotgun man sits back and looks on while his pistol shooting chum is put out, he will be the next in line. Plenty of people now hold that shooting small game with a shotgun is a murderous and cruel diversion. Birds are necessary as insect destroyers; we are trying hard to protect them and to see that they increase. Wouldn't it be much easier to do this if shotguns were eliminated? Other than to take men into the open, to make them strong of wind and limb, to add physique and endurance and virility to the human race, shotguns are of very little use. Game is no longer needed for food, and killing it is a mere survival of a savage instinct to destroy. Be sure, fellows, that plenty of reason will be found for doing away with the shotgun, better reasons than apply to the pistol, which after all is a rather harmless little weapon. Nine hundred and ninety-nine thousand nine

hundred and ninety-nine pistol bullets in the million are fired at some inanimate mark. We can't say that of the shotgun. The shotgun would have been the weak stick in the bundle except for the number of men back of it—a vigorous lot of hardheaded scoundrels.

The rifle will be the last firearm to go, for with it goes the Guard, the Army, and all means of national defense. The end of war is a good Christian doctrine, and must eventually come to pass. The elimination of the rifle is of far more importance than destroying the pistol and shotgun, for without the rifle war would be impossible. If it would be well to leave the nation without means of defense, we people who are fond of shooting a gun, merely as an innocent hobby, are in an unfortunate predicament, for the skill we develop undoubtedly would be an asset in war.

We will freely admit that the ideals held by our regulators are very high. There shall be no more war, no more crime, no more criminals, no more cheating in a horse trade. Every man shall be a good Christian gentleman, satisfied with one wife, drinking no whiskey, smoking no tobacco, spending no time in following wicked hobbies like shooting, but living with the serious intent of receiving a welcome from St. Peter. The only question is, not the object in view, but the method of securing it. For two thousand years people have been persuaded and coaxed and threatened with the devil. That method has worked very well, but it is slow. Now our sinners are to be forced, not by Christian law which has been found slow and gentle, but by man-made laws with teeth in them, backed, there is the joke, by the money of the men who would much prefer a bit of human liberty.

One thing I fear our regulators are not giving due consideration. Youth will have its fling. Dam a stream and it breaks out. If there is a choice of two evils, take ye the lesser. If a young man or an old man must have a hobby, let it be innocent rather than dangerous. If the vitality of youth must be worked off, let it be worked off in the fields, in the woods, on the rifle range, rather than on the dancing floor, the gambling den and the gangster's resorts. If some youth takes a deal of pleasure in shooting a small gun at a black spot on a piece of white paper, let him have his fling. Even if he continue to shoot until his eyes grow old and dim, let him. In all my life I have yet to see such a youth depart between days, leaving some girl behind who must forever wear a scarlet brand.

The 1866 Winchester

(Concluded from Page 12)

cisms and in order to improve the weapon obtained about four patents; namely, Nelson King's patent No. 55,012 dated May, 22, 1866, also Number 57,636 dated August 28, 1866, O. F. Winchester's patent No. 57,808 September 4, 1866; George W. Briggs' patent No. 58,937, dated October, 16, 1866. King's

patent provided for loading at the breech. As stated before some of these improved Henrys were known in 1865 and must have been made by the New Haven Arms Co., and as this firm stamped their name and serial number on the Henry rifle, it probably appears on the improved type without the forestock. The specimen in the U. S. Cartridge Company's collection is the Model 1866, but may have been made by the New Haven Arms Company in the latter part of 1866.

It may have been that the improved Henry without the forestock was responsible for the incorporation of the "Henry Repeating Arms Company on July 7, 1865 by special act of the legislature. This firm did not operate, as the stationery of the "New Haven Arms Co." was still in use in July 1866. On May 30, 1866 the name was changed to the Winchester Repeating Arms Company. Late in 1866 the plant was moved to Bridgeport, occupying a part of the plant of the Wheeler & Wilson Sewing Machine Company. The office, however, remained in New Haven, being at No. 193 Chapel Street east of Union Street from March 1867 to March 1871. In February, 1871 they returned to their present location on Winchester Avenue. B. Tyler Henry, however, did not go with the firm when it moved to Bridgeport, but stayed behind. In 1867 he is listed as a manufacturer at 18 Howard Street, and in 1870 as a manufacturer of springs (Henry Spring Company).

Advertisements in the *Spirit of the Times* for September, 1868 indicate the Winchester eighteen shot rifle was just being put on the market, and that circulars and pamphlets could be obtained from the manufacturers. The gun business during the first two or three years after the Civil War was temporarily dead. People had had enough of fighting. The only other repeating rifle of the time that was a serious competitor was the Spencer rifle, but the manufacture of this gun was discontinued in 1868, and on September 28, 1869, the machinery, tools, etc., was sold at auction. The Winchester acquired the stock of Spencers and from November 6, 1869 to May 13, 1871 they advertised for sale the following:

- 5,000 Winchester Repeating Muskets
- 5,000 Winchester Repeating Carbines
- 5,000 Winchester Repeating Sporting Rifles.
- 2,000 Spencer Repeating Muskets.
- 30,000 Spencer Repeating Carbines.
- 500 Spencer Repeating Sporting Rifles.
- 2,000 Joslyn Single B. L. Rifles.

Writing about guns reminds me of the story of the three students (one being a German, one an Englishman, and one an American) being required to draw a picture of an elephant. The German evolved a picture of an elephant out of his inner consciousness; the Englishman went to the public library and read up all about elephants; while the American went to the zoo and took a look at an elephant. So it is hoped that if there is a Henry rifle with King's improvement, that there will appear a picture of it in the columns of *THE AMERICAN RIFLEMAN*, (where we all can look at it) with complete description, etc., a little more accurate than the U. S. catalog.

Thoughts of the Minute

By Allyn H. Tedmon

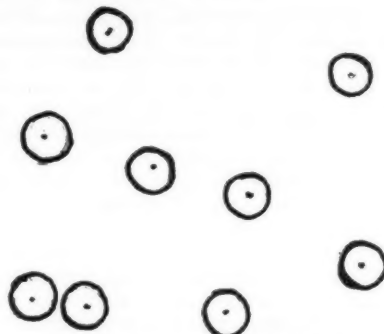
IN the July 1 issue of THE AMERICAN RIFLEMAN, Chauncey Thomas had a story wherein he told of a number of close groups he had, at that time, recently shot. Shortly after I happened to be talking with a certain person who had read the story, and while he didn't come right out and say so much, but it was very evident that he didn't believe that Thomas or any one else ever shot such groups. I think when I got through talking to him he believed it, hope he did at least. Since this experience it has a number of times occurred to me that possibly there were many others who, mentally at least, doubted the truthfulness of such information as often appears in shooting notes.

The proof of the pudding is in the eating. The other day C. T. and I happened to be out to the range. He wanted to try out some ammunition he had recently loaded up. He had his pet Pressure Springfield. He shot a group or two which were very good. Then he handed the rifle over to me to try. It is mounted with a Winchester scope and having never fired it and not being used to a scope at all I hesitated, but to please him I lay down, prone rest, and shot nine shots into a group that C. T. wasn't ashamed of himself. From center to center it measured just two and seven-sixteenths inches. Two hundred yards. I was greatly surprised because I had given up target shooting because of the poor condition of my eyes, and here hangs a tale which I will tell shortly. But back to the group—Some may doubt that I shot it. I might myself, but I did. That rifle of C. T.'s is a wonder, and don't any of you .30-30 specialists kid yourselves into thinking that such arms won't shoot. It's uncanny the way they poke those boat-tails into nearly the same hole.

But just a word on a scope. I have never used a scope, in fact, hardly ever fired a shot with one until this mentioned time. I couldn't see the target with my naked eye at all. In fact when shooting at the regulation bull later, with a Krag carbine with Lymans, I could hardly hit the paper. I couldn't see. Yet with a scope, I could and did shoot good enough to make much better men get busy to beat me. As I have said I had given up shooting at a target at all, and only shot this time to please C. T. I am mighty glad now that I did for I am, as fast as possible, going to equip my rifles with glass eyes, and right now I feel like a kid out of school and look ahead to some more real shooting, like I uster sometimes do. You can't hit the bull's-eye if you can't see it, and if you ever could shoot and can't now, there must be a reason, and maybe a scope might solve it.

I have a good joke on Thomas. You may remember some time ago a long howl he let out when he threw out his last reloading tool. "Never again," he told us, and for a while he kept his word. But you can't keep a bird like him on a grub line long. He shot fixed

ammunition quite a while, for him, but at last one evening the fever took him and before morning he had borrowed tools, etc., and had loaded a new batch of shells. They shot fine, too, and now he is tickled to death because he can shoot the old pet for about three cents as against ten or better before.



The group Mr. Tedmon speaks of.

"So This Is Lima!"

(Continued from Page 8)

which occasion we hope to remove, gently but firmly, the silver cup from the able hands of our good looking friends from the Argentine, who took it away from the Americans in 1913, and have held it ever since because there have been no matches. The job is not precisely like taking candy from a baby as those can certify who have seen the Argentinos perform. The Americans are quite likely to open their kneeling stage with the score against them at the end of the standing position but any team that can defeat our outfit in the kneeling and prone is welcome to the trophy.

And that's all for this issue.

The Great God Gun

(Continued from Page 2)

and drilling front apertures is a jewelryman's job not for ordinary folks. You can make the rest of the sight all right, with files, vise and a stopped clock, but hardly the aperture. When you want those, go up to the jewelers, or some pawnshop, and for a dime buy enough discarded broken watch and clock hands to make all the sights you want. Solder them in place and be happy.

Recently the United States Government and I have been doing business. One Krag carbine—\$4 plus 75 cents postage, and nothing for the goo. That stuff sticks like a homely girl to a rich kid, but merely common coal oil—kerosene—on a rag wipes it all off like hot water. You don't have to take the little things apart, just pour the kerosene over the bolt, etc., with a cut, and wrinch with a second cup of clean kerosene. Unless you have been careful enough to have a lot of Fords and radio cranks among your ancestors, never take a gun apart without a book of instructions. I pulled down a hammerless .45-70 Sharps in the Hills this summer, that had not been in a generation, and put it together in half

an hour. It was the first one I had so done in twenty-odd years. Last week I tackled another, and for the life of me, after most of the afternoon spent on it, could not make it work. Had forgotten some little slip. A friend of mine recently spilled his .45 Colt automatic over my bed and put it together with his eyes shut. The first time he tried it he spent all day over it, for there was no one around who knew how and he had no instruction book. Here is where Whelen's "American Rifle" is a sort of Bible to those who rumage among the works of passe arms. It tells how to take down and put together more guns than any other ten books that I know.

Last Sunday I wandered alone into a rustic amateur turkey shoot, where they shot the rust and mixed makes out of the family .30-30 and hit the 4-inch bull's-eye at least half the time 100 yards away from a shaky soap box rest. I declined to shoot, for it would have been petty larceny, but to amuse them hit some pennies as souvenirs, an average of a penny every two shots. I used the 13-pound 30-inch afore-said No. 28 Olympic free rifle (Springfield) and home loaded cartridges, containing 45 grains No. 16, 8½ Remington primer, Government 170-grain boat-tail bullets, in Remington W. R. A., U. S., Peters, Western, and Arsenal shells indiscriminately, loaded without re-opening the necking of the shells; that is, with an uneven "pull-out" on the bullet. Shot 100 yards, rest, rear No. 48 Lyman, and front aperture of 90/1000ths, with rather heavy ring round the hole, about twice as thick as the ordinary No. 17 Lyman front aperture ring.

Good shooting, yes, day perfect, and all that, but the point is that Mattern in his recently published excellent series of articles in this magazine on reloading says that accuracy cannot be had unless the neck-opener is used, and Huffman, testing more or less under Whelen in Columbus, Ga., writes me recently that he finds that it makes a great deal of difference what make of empty is used with otherwise the same reload. I believed, and am much inclined still to believe, that both of them are right, yet just the opposite results fell to my lot Sunday. I could hardly ask for more accurate ammunition, it grouped 4 inches lower and 2 inches to the right of the 1923 Match, but gave closer grouping at 100 yards at least. Incidentally, for me at least Sunday, the 1924 arsenal match ammunition shot exactly the same, at least at 100 yards in my free rifle, as the 1923 match. But the 1924 match does not have the primers slugged in, so it can be reloaded—I hope. All my shooting Sunday was done at 100 yards same sights, rifle, etc. Moral—What holds true with one man does not seem to hold true with another. Also, what seems to be true one time with the same man and gun and load, often may just reverse itself some other time. It is the uncertainty in this gun game that makes it interesting. When we hit all the time we either quit or get farther back.

Projectiles During Flight

(Continued from Page 6)

branch of its flight is proceeding forward a greater distance than the distance it is falling, the upper aspect of the projectile's surface is subjected to a greater air pressure and consequent air friction than the air impact and consequent air friction of its lower aspect. But when, as in the case of high angle elevation like that cited by Mr. Ingalls, the falling distance of the projectile is greater than the distance of its forward progress during the falling branch the greater air pressure is on the lower aspect of the projectile and the induced drift is to the left, as per the following illustration (Fig. 16) in which:—

A shows the projectile during its rising branch drifting to the right in consequence of maximum air friction on its upper aspect. *B* shows the projectile's horizontal advance during its falling branch. *C* shows the projectile's vertical descent. *D* shows the lower aspect of the surface of the projectile subjected to a maximum air friction as the effect of the air pressure component arising from the rotation of the projectile on

plosive in the gun is substantially dissipated in propelling the projectile to the summit of the trajectory, thus leaving the projectile during its falling branch almost totally subject to the retarding influence of the atmospheric opposition in its front, and to the greater influence of gravity upon the more bulky rear portion than upon the smaller, lighter and atmospherically retarded front end. Hence the heavier and less obstructed rear portion of the projectile in falling approaches the end of the flight more rapidly than the front end is descending, and correspondingly tilts the projectile so that it points outward as shown.

The increase in the drift to the left, during flights in which the projectile is falling a greater distance than it is progressing horizontally forward, is due to the increasing velocity of the descent and to the increasing tilting of the longer axis of the projectile in accordance with the principle upon which that tilting depends as hereinbefore described.

The combined effect of the increase in the rate of descent, together with the more direct exposure of the lower surface of the projectile to atmospheric opposition by the increasing angularity or tilting

the left; but on the contrary the drift to the right continues, and demonstrates conclusively that the maximum air pressure is on the upper quadrants and that its long axis is substantially parallel to its trajectory, after the first few hundred yards of its flight.

If this reasoning is correct the drift should increase as the projectile progresses from the summit of the trajectory, and this is what actually occurs.

The drift not only continues, but increases during the falling branch of the trajectory until it is considerably more than two times as much as at the apex of the trajectory, although the speed of the projectile during that declination averages about thirty per cent less than it was at the apex of its flight. This indicates an extraordinary increase of air pressure on the upper quadrants of the projectile, which is due to their greater angular exposure to the air which opposes the projectile's horizontal advance, and correspondingly increases the friction on the upper quadrants and especially the left one, thereby forcing the projectile in the direction of less resistance, namely, to the right.

During the latter part of the falling branch of the trajectory the drift to the right is lessened by the diminished rate of progress of the projectile and the slower rate of the rotation of the projectile on its long axis.

The precession of the rifle projectile in flight is precisely similar in principle to the precession of the drifting axle of a nutating gyroscope and the epicycloidal precession of the peg of a leaning nutating top. That is, they all three are impelled away from that area on their surfaces where dominant friction due to their rotation and nutation occurs.

Shotgun Pressure Curves

(Continued from Page 10)

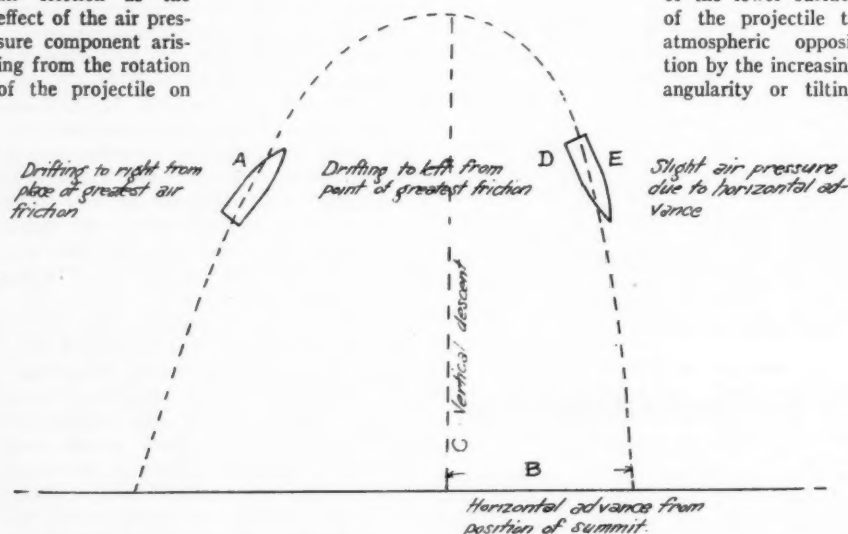
to 1½ ounces, du Pont Oval will permit it.

In the 16-gauge gun, 1½ ounces of du Pont Oval gives the same ballistic results obtained with ordinary powders with one ounce of shot. In the 20-gauge where ¾ of an ounce of shot has previously been used, it is now possible to use as much as one ounce of shot with du Pont Oval powder and still keep within the pressure limits of the ¾-ounce load.

It is hoped that the foregoing ballistic data and the brief comment on the individual characteristics of du Pont shotgun powders will be enlightening to many sportsmen, and will help them in choosing the best type of powder for a particular purpose. There is no one powder capable of performing under every condition nor should the sportsman expect to find one universal shotgun powder any more than he would expect to discover one make of automobile equally suitable to all problems of transportation. Recoil, hygroscopticity, the weight of shot charge, the weight of shotgun, are all separate and individual problems and have a distinct bearing on the choice of the powder that is to be used.

Altogether these powders form a group that sportsmen can select from with every assurance of obtaining good results, provided they choose suitable loads—and aim straight.

FIGURE 16
DRIFT AT HIGH ANGLE FIRING



its long axis coincident with its vertical descent at an angle to the horizontal. There is a slight vacual influence on the lower aspect due to the projectile's horizontal advance during its falling branch and a concurrent slight increase of air pressure on its upper aspect *E* due to that advance, both of which tend to lessen, but not materially, the effect of the air friction at *D*.

The specially noticeable feature of Fig. 16 is the attitude of the longer axis of the projectile with relation to the trajectory during the falling branch. In that figure the longer axis of the projectile during the falling branch is pointing outside of the area bounded by the trajectorial course, whereas in the rising branch and as shown in Fig. 14 the longer axis of the projectile is pointing within that area.

The attitude of the long axis of the projectile as it appears in the descending branch in Fig. 16 is due to the fact that the momentum of progression derived from the ex-

of the longer axis of the projectile to the trajectorial course, is a corresponding increase in the degree of air friction on that lower surface and of the increasing drift of the projectile to the left to which Mr. Ingalls so emphatically alludes in his interesting reference to that phenomenon in his statement above.

In short, the drift of rifle projectiles to the right at long ranges incidentally proves that the long axis of such projectiles, progressing after right drift commences, remains substantially parallel to the trajectory. If the long axis of the projectile continued parallel to the line of departure, or even approximately so, the lower half of its surface in the descending portion of its trajectory would be subjected to greater air pressure and friction than the upper half, both by its vertical descent and by the greater angular exposure which that surface would present to the air in its front. (See Fig. 9), which would give it a drift to



Conducted by ————— C.B. Lister

Iowa Bankers' Association Holds Annual Shoot

FOR the second time in the history of the United States, a state meeting of officers of the law charged with the protection of banks has been held. These matches were conducted on the range at Fort Des Moines on October 27 and 28, under the auspices of the Iowa Bankers' Association and under the immediate supervision of Col. F. M. Caldwell, Commanding Officer, Fort Des Moines, and Lt. Col. A. H. Davidson, who captained the Cavalry team this year and who was stationed at Fort Des Moines when the shoot was scheduled.

Thirty-nine counties were represented at this second annual shoot. Each county was represented by two vigilants who had been selected at an elimination county shoot. In addition to the 39 counties who had representatives on hand, a subsequent bulletin from headquarters of the State Association indicates that at least three additional counties were unable to be represented only because of the non-arrival of sufficient ammunition to permit the holding of state tryouts in time. Each of these three counties has held a county shoot of its own in order to give the local vigilants an opportunity to show what they can do with the rifle and revolver.

Three hundred and thirty-five dollars in cash was distributed. Half of this went to the rifle competition and half to the pistol matches. The rifle match was fired on October 27th and called for ten shots standing at 200 yards, ten shots kneeling or sitting at 200 yards, ten shots prone at 300 yards, and ten shots sitting at 300 yards, all slow fire. In addition, there were three rapid fire strings, ten shots sitting at 200 yards, ten shots prone at 200 yards, and ten shots prone at 300 yards. The revolver matches, fired on October 28th, called for ten shots slow fire at 15 yards, and ten at 25 yards, twenty shots timed fire at 15 yards, ten shots rapid fire at 15 yards, and ten shots rapid fire at 25 yards.

The expenses of transportation and subsistence were borne by the County Bankers' Association. Following the matches, the competitors were the guests at dinner of the Iowa Bankers' Association at the Des Moines Club, and after dinner were taken to the Orpheum Theater. The vigilants were addressed by Mr. C. J. Wohlenberg, President of the Iowa Bankers' Association, Col. F. M. Caldwell, Sheriff George S. Bassett, Lt. Col. A. H. Davidson, the Hon. Benjamin J. Gibson, Attorney General of Iowa, and the Hon. N. E. Kendall, Governor of the State. This line-up of speakers indicates more plainly than anything else the intense interest which the entire citizenry and officialdom of Iowa is taking in the efforts of its

bankers to stamp out robberies and hold-ups by the most efficient method.

The outstanding shooter of this year's matches proved to be Vigilant Otto Weustenberg of Scott

CIVILIAN CLUB SECRETARIES

IF YOU could sit down at a table with the secretaries of every civilian club in the United States and discuss plans which have proven successful in bringing in new members, getting out old members to matches, getting publicity in the local papers, raising the necessary funds and similar subjects which are familiar to every secretary you would come out of the meeting with a wealth of new ideas and renewed energy. Such a personal gathering of secretaries is, of course, not feasible at the present time. There is no reason, however, why the stories of successes and failures should not be passed around from one club to another. The failures are often more important than the successes, because more is to be learned from them.

The best possible medium for the exchange of views and experiences between club secretaries is in the columns of THE AMERICAN RIFLEMAN which is sent twice a month, without cost, to every club.

A section has, for some time, been devoted in this publication to the news of club activities. Hundreds of clubs, however, have not corresponded with the magazine. It should not be forgotten that events which are commonplace enough in one locality are brand new ideas somewhere else. The "N. R. A. News" section of THE AMERICAN RIFLEMAN should be the most valuable part of that magazine, and can be made so with your support. If you have not been forwarding material for publication, start now. It is not necessary for you to write in flowery language. State the facts, and do not attempt to gloss over failures. Give the full circumstances and tell why you think they failed. In no other way can other club secretaries gain by your experience.

If you will take hold of this matter and view it in the light of a general round table discussion among club secretaries there will be a great many more clubs in the "active" column at the close of the coming year.

County. Weustenberg won the rifle match with the excellent score of 331, five points ahead of D. W. Price of Johnson County. On Tuesday, Weustenberg repeated with the revolver, turning in an aggregate of 588, which was six points

ahead of his nearest competitor, Elmer Jens, also of Scott County.

The performance of Weustenberg will be particularly appreciated as the winning of a real shooting match when it is said that in order to win he defeated such riflemen as D. W. Price of Iowa City, D. Verne Moses, F. E. Border, J. Dorweiler, and a number of other well known National Match and small bore riflemen.

Mr. Frank Warner, Secretary of the Iowa Bankers' Association, tells us that while funds were available for the sending of only two shooters from each county, practically every county in the State reported that its elimination match was attended by from twenty to fifty shooters. The shooting program as an integral part of the vigilance plan of Iowa seems to be definitely established. The vigilants throughout the State are as enthusiastic about their work as anyone could wish for, and no small part of this enthusiasm is due to the annual State match, preceded by county elimination competitions and the practice matches leading up to the county events. By next year, it may be anticipated that Kansas will have followed Iowa's lead in the matter of State competitions for the vigilants' organizations.

* * *

SOMETHING TO THINK ABOUT

Desmond Burke who won the King's prize at Bisley, 1924, as a sergeant in the Governor General's Footguards, Canada, has been officially promoted to the rank of lieutenant. Lieutenant Burke is at the present attending Queens University, Kingston, where he has started a five-year course given him by the citizens of Ottawa in honor of his winning the King's prize.

The King's prize represents the championship of the British Empire. Our President's Match, or National Individual Match compares with the King's rather closely. In this honor which is being done the young Canadian marksman because he won the King's, there is something for American communities to think about. If one of your club members won the President's would anyone outside of the club ever know about it?

* * *

LEAGUE IDEA GAINING GROUND

The idea of organizing rifle shooting leagues which shoot regular schedules in the same manner as baseball leagues is finding increasing favor among active club secretaries. The gathering together of riflemen from opposing clubs on a common range is undoubtedly the most effective method of increasing interest in the shooting game. Where it is impossible to arrange shoulder-to-shoulder matches, the league idea can be carried out by mail, but in many cases it will be found that a small four or six club league can be organized, in which the teams may travel by automobile or interurban for their shoulder-to-shoulder matches. In the case of clubs so far apart it would be inconvenient to travel the entire distance, arrangements can always be made to fire on some neutral range midway between the two competing towns.

This subject of leagues is another one that has been covered intensely in THE AMERICAN RIFLEMAN during the past few years, both in special articles, and under the "N. R. A. News" heading.

A NEW DEPARTURE

With the announcement in this issue of the special subscription rate for combined subscriptions to *Forest and Stream* and *THE AMERICAN RIFLEMAN*, a new departure in the circulation policy of this magazine is launched. This special rate will apply to everyone and should result in a considerable extension of N. R. A. interest among sportsmen who are not at the present time members.

With two magazines of the caliber of *THE AMERICAN RIFLEMAN* and *Forest and Stream*, to work with, you can approach sportsmen who, up to the present time, are not interested in the dyed-in-the-wool target shooting game, and very probably interest them in a subscription to *Forest and Stream* and *THE AMERICAN RIFLEMAN* combined. It is assured that having read *THE AMERICAN RIFLEMAN* for a year, your sportsman friend will be considerably more interested in organized rifle shooting than he has ever been before. The extension of the circulation of the magazine, like the extension of membership in the N. R. A., depends almost entirely on the individual efforts of the members of the Association. The larger the subscription list, the better magazine we shall be able to give you. See what you can do to take advantage of this new club rate plan as a subscription booster.

* * *

CLEVELAND TRUST COMPANY ARMS ITS EMPLOYEES

The Associated Press under date of November 17th carried a dispatch to all the newspapers in the United States served by the A. P. covering the purchase by the Cleveland Trust Company of \$15,000 worth of arms and equipment for all the bank's employees, on the street or in the lobbies of the fifteen branch banks maintained by the company. A range has been established in the basement of the main office of the Cleveland Trust Company and training of the employees is to be started immediately under the direct supervision of three of the bank's vice-presidents. This policy is exactly in line with the plan which has been used successfully in Iowa, and is now being put into effect in Kansas as a check against bank holdups.

It is to be hoped that the widespread publicity which has been given the action of the Cleveland Trust Company may have a salutary effect on the other large banks and institutions throughout the country. Local clubs should not overlook this opportunity to place themselves in the good graces of their banks by offering club range facilities and experienced shooters from the personnel of the club to train the tellers, clerks, messengers and runners. There are a mighty few people in your community who can be of more value to you than your bankers. It will pay in more ways than one to cultivate their friendship.

* * *

WHEELING, WEST VIRGINIA, APPEALS TO SPORTSMEN

The Wheeling, West Virginia, Rifle Club was organized largely from the membership of the West Virginia Wild Life League, and as a result has a great many shooters on its rolls whose entire experience has been with the rifle in the field. This has proven no handicap to the

Wheeling outfit, however, many of their matches being divided into two classes, one for those using open or hunting sights, and the other for those using the more conventional target sights. Matches are also designed to appeal particularly to the hunters.

One interesting condition which we find in several of the matches of this organization is that the rifle used by the contestant must be owned by him or he must contemplate purchasing it. This stipulation serves the purpose of preventing the friends of a man who owns a particularly good target rifle from taking advantage of that fact, and puts everybody on a four square basis. This will undoubtedly encourage the purchase of good, accurate rifles on the part of the interested members of the club who do not own them at the present time.

Incidentally, this club seems to know how to handle a rifle range, as we learn that on Saturday, October 25th, using a single target carrier, twelve men fired a twenty-shot match between 2.30 and 5 o'clock, an average of nine shots every five minutes. This is an object lesson which may be borne in mind by some executive officers who are afflicted with one or two shooters who think they have to have all afternoon in order to sight in and fire a ten-shot match.

* * *

CUTTING AND CROSSMAN TAKE PERMANENT POSSESSION OF CUPS IN LOS ANGELES COMPETITION

Three perfectly good trophies which have been up for competition since early in the spring, disappeared Sunday, Oct. 12, at the regular shoot of the Los Angeles Rifle and Revolver Club, two parties by the name of Ned Cutting and E. C. Crossman having been seen disappearing over the hill just before the trophies were missed.

The three prizes, the W. D. Murphy "any rifle and sight" trophy, the R. J. Fraser "offhand" trophy, and the Earl M. Nutting "kneeling" trophy, were up for any man good enough to win three legs on them. The two parties suspected in the matter had already taken two legs when the Sunday shoot came along.

Cutting is Star

Probably the best shooting of the day was done by Ned Cutting, who drifted in to the range at noon and found a 238 ex 250 score facing him, made by a party like himself, already holding two legs on the W. D. Murphy silver pitcher. Cutting had to make better than this or lose the pitcher for good. When his last 24 was marked up it was found that he had tied the 238 and "Creedmored" his rival by virtue of having fewer low shots in his string. Incidentally he tied an Olympic match barrel with his old stovepipe cannon.

The Earl M. Nutting kneeling trophy was taken with the record score of 226, topping by 6 points the highest score made on the range in this position and beating most of the prone scores made on the range Sunday.

Bob Fraser saw his offhand trophy, the subject of many hot battles during the summer, finally taken by a party who had thrown a cold two early in the string and was apparently out of the running. E. D. Neff's 197 looked like a winning score up to the last two or three shots of the final winner of the trophy.

The new W. D. Murphy "iron sight" trophy for prone competition was put on the program for the first time, Crossman winning the match and the five points hung up for first place. Cutting took down second and three points, and Mrs. Crossman third and two points. The trophy, like the B. L. Graves, being hung up on the point system with the final winner the man with 15 points to his credit.

The next club shoot sees the competition for the E. C. Price, the B. L. Graves and the Crossman trophies.

* * *

SERVICE RIFLE MATCH FOR WESTERN MONTANA

The Fort Missoula Rifle Club is laying plans for the conduct next spring of the shoulder-to-shoulder regional Service rifle match which will be open to club teams from the entire state of Montana and from nearby sections of Idaho and Washington.

Lt. Norman C. Caum is secretary of the Fort Missoula club. He will be very glad to hear from the secretaries of clubs who hope to be able to make the trip to the Fort for the big matches next spring. The executive committee of the Fort Missoula club is to be congratulated on their successful efforts to promote the Service rifle game in their part of the country.

* * *

NEW JERSEY STATE POLICE QUALIFY NINETY-SIX PER CENT

The 1924 pistol qualification report of the New Jersey state Police has just been received. It shows that of 126 men firing the regular Army pistol qualification course, 50% qualified as experts, 42% as sharpshooters, 17% as marksmen and only 5% who failed to qualify. Sgt. Alfred Harper, Troop A, turned in the highest score over the course with an average of 95.11. Corp. N. Wagner led the men of Headquarters Troop with an average of 94.04. Trooper 1st Cl. J. E. Gregoviser led Troop B with 93.97.

The high scores last year were all made by officers. The Department of State Police is considerably gratified to have the enlisted men "showing the way" this year, and reports that there seems to be a great deal of enthusiasm created by this fact. As a matter of fact, the high enlisted men in the qualification firing challenged the five officers to a revolver match which was fired on the 14th. The officers succeeded in maintaining their prestige by defeating the troopers with a team score of 1188 compared with 1076. The course fired was the N. R. A. Camp Perry police pistol team course.

* * *

THE POLICE AGAIN

The police had a good time at Perry this year. There were a lot of them who went home with a new idea as to what the National Rifle Association amounted to. The police field is one of the most fertile that you can work in. Don't pass it up. Probably your best opportunity of obtaining a municipal range is to enlist the cooperation of your local police authorities. Any assistance that the Washington headquarters can give you will be gladly rendered.

LOOK OVER YOUR BACK COPIES

During the past two years there have been a great many articles in *THE AMERICAN RIFLEMAN* which are of real value to club secretaries. These articles have covered Thanksgiving and Christmas turkey shoots, get-together meetings, smokers, and any number of plans for interesting the public and increasing the interest of your own club members in your organization.

Look over your back copies and try your hand at applying some of the schemes which have been outlined to your community. Back files of *THE AMERICAN RIFLEMAN* make up the most valuable volumes that a rifle club secretary can have in his ready reference library.

* * *

AN ELIMINATION MATCH

The following extracts from a letter from Mr. A. J. House, secretary of the rifle club at the Union Paper & Twine Co., Detroit, should be of interest to secretaries who are looking for some method of varying the monotony of bull's-eye gallery shooting.

The company has also donated the use of a room as a clubroom. We have regular shoots every Thursday night, and once a month have dinner, or shall we say, a lunch which we prepare ourselves with a regular camp outfit. After dinner we discuss ways and means and then proceed to our regular program. The last meeting of this kind was held Thursday, November 13th, and to vary the regular shoot we had a series of elimination duels.

For instance, we fastened clay pigeons to the target carriers and let them out 75 feet for a rifle and 60 feet for a pistol. The club members were paired off and shot against one another. Each contestant was allowed five shots and started firing at a given time and the first one to break the clay pigeon was the winner. If neither contestant broke the clay pigeon both were eliminated. The winners then, of course, again paired off and at the finish there was only one left. This makes a very interesting and exciting pastime.

* * *

NEW SMALL ARMS RANGE FOR FORT WORTH RIFLE AND PISTOL CLUB IS COMPLETED

With the recent completion of a pistol and small caliber rifle range located under the northern end of the Paddock Viaduct, the Fort Worth Rifle and Pistol Club now has complete facilities for all manner of small arms practice. Its high power rifle range, the old Camp Bowie range, located northwest of Arlington Heights, has been in commission since the club was organized in 1921. The viaduct range was installed by authority of the City Commission, and was financed by donations from members of the club combined with a substantial gift from Montgomery Ward & Company.

There are at present several vacancies in the membership of the shooters' association, according to Herbert Weiler, secretary, and it is desired to fill these during this year. Until January 1, annual dues and initiation fees are two dollars each, while after that date the initiation fee will be increased to five dollars and the dues to three dollars. Applications for membership should be filed with Mr. Weiler at the office of the superintendent of mails, Postoffice Building.

Several interesting events are planned by the riflemen for the near future, Weiler said, among them being a revolver match between Fort Worth and Dallas police departments, and Tarrant and Dallas County sheriff's departments. Challenge for the policemen's shoot already has been for-

warded by the local department to Dallas. Fort Worth peace officers have been given privileges of the club's ranges since they were constructed.

* * *

ENRIGHT WOULD HAVE COPS SHOOT A LITTLE STRAIGHTER

The shooting galleries' best customers hereafter will be policemen if an order issued by Commissioner Enright before his departure from New York is followed. It calls on every member of the department to practice marksmanship on all possible occasions.

As an added incentive the policemen hereafter who qualify with a score of 70 to 80 will have two extra days of vacation and those receiving a score above 80 will get four extra days. Each man qualifying will be given a small gold insignia in the shape of a miniature target, to be worn next to the precinct numeral on the collar.

The Commissioner is reported displeased over the lack of sharpshooting in the department, and has hinted that it would be a good thing if the shooting gallery hobby replaced the cross-word puzzle and radio habit.

1925 NEW YEAR'S RESOLUTIONS

- 1—To renew my N. R. A. membership and subscription to *THE AMERICAN RIFLEMAN*.
- 2—To write to my Senator and Representative opposing an anti-pistol law.
- 3—To remember that this is not the last year of grace and to shoot my game accordingly. I may leave a grandson who will enjoy hunting if I leave anything to hunt.
- 4—To buy no imported bargain junk, either firearms, ammunition or other article. We make better here.
- 5—To be glad that I was born and live in these United States and to be prepared to prove it if called upon.

ALBERTSON of Lewes.

SOME IDEAS FROM THE AMERICAN LEGION OF WALTHAM, MASS.

Replying to your communication of the sixth of November relative to locating and financing our rifle range, I must say that we have had no experience along that line because of the fact that we use both indoor and outdoor ranges of the National Guard of this city. We have been fortunate enough to have the use of these ranges ever since our club has been organized and you may be assured we are grateful for the privilege.

Personally, I believe it cheaper in the long run if swampy ground can be obtained because of the low price or rental charge for such ground and the amount of labor and the materials required to equip it is reasonably small. Tillable land or land used for pasturage is generally double the price of swampy land, hence the saving here could be used for improvements and equipment as is necessary.

Question four is a big item to the clubs with a small number of active members. During the winter months this club holds what you might

call Happy Parties, i. e., we run a time at the Legion Hall wherein games of all kinds are played; sober games, comedy games and foolish games, and the grown-ups enjoy them all because they come again and again. We charge a small fee (generally 25 cents), the expenses are small and the profits small also but they add up surprisingly.

We run whist parties and never lack for donated prizes. The main idea is to have a good time and we find that if a good time is sought and obtained the profits take care of themselves.

We also use the game of match par and charge a fee of five cents per total score each man. This adds up sufficiently to make it a valuable item of income. Also, this game keeps up the enthusiasm of the shooters which is necessary if the members are expected to keep active.

I generally keep the bulletin board well pasted with news of the team's activities and incidentally stick up a little prose that is just pure comedy (this keeps them scanning the board frequently) for the purpose of keeping smiles all around. If you can keep your members smiling and give them something to talk about that will make them grin and be happy the financing part of anything is simple. If contributions are sought on a small scale, but often, it doesn't seem to hurt and as long as a member is not hurt he can smile.

A. H. TRUMBLE, Sec'y.

* * *

GIRLS STAGE MINNEAPOLIS TURKEY SHOOT

The Girls Municipal Rifle Club which is conducted by the Recreation Department Board of Park Commissioners of Minneapolis held a pre-Thanksgiving turkey shoot at the Kenwood Armory rifle range Thursday, November 20th.

This affair was open to members of the club and to any girl in the city who wished to try for the turkey. In order to make it fair and square to all, shooters were given "luck targets" instead of a regular target and the one who got the highest score on one target won the turkey.

These targets sold for ten cents apiece and the shooters were allowed three shots on each target. The girls could buy as many targets as they wished. The highest possible total for three shots was 54. If a shot struck a cross line all numbers in the four surrounding squares were counted. If a shot struck on a line between two squares the two numbers counted.

Twenty-five girls showed up at the rifle range and they bought targets one after another. It was all a luck affair as the numbers were invisible from the firing line and a beginner had as much luck as a crack shot.

Forty-two was the highest total for a long time but the girls were not satisfied with this and kept on buying chances. Mrs. Lester R. Moore, 1864 Sargeant Ave., St. Paul, Minn., won the turkey with a score of 46.

The money taken in more than paid for the turkey and nice little profit was turned into the club's treasury. Everyone had a very enjoyable time and a number of new members were enrolled in the club that evening. We also had a nice crowd of spectators. The affair was advertised in the newspapers and this helped to make the club better known.

CLUB BULLETINS

Club bulletins are an essential feature in holding the membership of your club together and keeping them interested. The bulletins issued by C. C. Finn, Secretary of the Seattle, (Washington) Club are examples of how such bulletins may be made sufficiently interesting to be looked forward to by every club member. The latest Seattle Bulletin follows.

SEATTLE RIFLE & REVOLVER CLUB

First and most important. Someone broke into Art Johnson's house and took his Winchester 52. As this happens to be the most accurate gun Art ever had he feels peeved about it. Gun is No. 720 and can be further identified by a Springfield rear sight fixed base which Art soldered on it to carry his Knobbe-Johnson scope mount. Should this have been removed the place where the bluing was polished off the barrel and some traces of the solder will probably be left. If anyone offers you a bargain Winchester 52 look closely at it and holler for Art and the Police.

Walter Hinckley says he will be ready to entertain company at the Armory this Friday evening at 7:30 P. M. USRA matches start on January 1 and we ought to get the .22 pistols tuned up before that. If you are interested at all in the game come on down and look on even if you haven't a gun. Hinckley and Johnson won medals in the USRA individual championship; Hinckley getting fifth national place with the .22 pistol.

Turkey shoot was nothing much to write about. We lost 51 turks and the Ranier Club 11. They made a little money and we broke even. The pool game will go better when it is better known but our long range game is surely well known and attracted the smallest crowd in years and this is especially disquieting as we had an ideal day.

On November 2 we shot the Pistol Team Match at Fort Lawton. Team possible 1500, scores as follows:

Seattle Police	1302	Outlaw Team	1147
Fort Lawton	1274	Federal Res. Bk.	1112
Battery A WNG	1221	Post Office	996
Seattle R. & R. Cl.	1188	Dexter-Horton	899
Ranier R. & R. Club	632		

With the exception of the Ranier Club you will note that the contestants with least money to worry about are the best able to protect it. Dr. Snively of our club was fourth individual. Colonel Davis inspected the match and advised all present that they were welcome at Fort Lawton and that other events would be devised to get the gang out there frequently. The Colonel also shot in some of the turkey pools at the turkey shoot and found out how we run the game. As there is to be much .45 shooting at the Fort you might as well get your old gat in out of the rust.

On November 9 the Pistol Qualification was shot. Some 50 contestants showed up. Members of our club qualified as follows: 80% is required for expert. Meyer 82%, Captain Hale 88%, Henry Jilg 87%, Finn 80%. Chester Heuman had a pistol with a crooked barrel or else his target was nervous but he will do better next time. Won't mention his score. Lieutenant Waltamuth acted as Executive Officer and incidentally made 87.7% himself between times. Shoot ran off very smoothly and in good time for so many contestants. The regular Army decoration will be issued to all who qualified.

On December 12 at 7 P. M. on the Police Range will be held a 10-shot match for both heavy and light hand guns. The .22's will shoot in one class and the heavier in another; 10 shots in each class and you can enter either or both. Come on down and bring some kind of a gun and get acquainted. Police have promised to arrest anyone with a specially nice gun and confiscate same so an interesting time should be had.

Only three entries in the indoor .22: Meyer, Heuman and Hale. I am not going to start this game and involve myself in arguments with my wife for being out two evenings a week unless the turnout makes it worth while. If you want to get in on this let me know.

We are advised that members can get "Forest and Stream" and the "American Rifleman" at a club rate of \$3.50. Both are interesting and you should at least have the "Rifleman" so you will know what is going on in the rifle game.

SOME IDEAS ON GALLERY CONSTRUCTION FROM LAMAR, COLO.

There is nothing of special interest in our range equipment except possibly the indoor target back stops and lighting.

Our lights are 200 Watt globes per target, these are fitted in tin quarter circle reflectors that

sit on the floor and are moved near or far from the target as per the personal desires of the shooter.

The back stops are wooden boxes 14 inches wide, 36 inches high, and 18 inches deep, mounted on casters so as to be easily moved out of the way when the room is used for other purposes. They are entirely lined with extra heavy sheet iron (20 gauge I think). Each box has a piece of sheet iron sloping from top in front to bottom at back one-eighth inch thick, which are to deflect all bullets hitting the box to the bed of sand in the bottom of the box.

Directly behind the center of the top bull is a heavy hinge on which is riveted a piece of boiler plate one-half inch thick and 4 x 4 inches in size. This piece of boiler plate has to be renewed each year as the .22 bullets will peck a hole through it in 3 months on a busy range. The plate is greased and swings so that it does not get full force of bullet and the "splash" of the lead is reduced.

A pin is left projecting in front in the middle of the box which serves as a pivot to turn the target and we turn it so as to shoot on the top bull each time. All the other bulls are covered by a board over the target front which is notched so as to show only the one bull, and is hinged with screen door spring hinge at bottom. This also holds the target in place.

Once each year, the lead is removed, melted and sold to the plumber, and puts several dollars in the club treasury.

The targets are operated from the pits, which are made bullet proof, and from which each shot is called for the benefit of the shooters.

Directly behind the bull is also a removable board 6 x 6 inches, which is replaced often, so that the bullets cut clean holes. This board is held in place by the sheet iron behind, and a piece of clock spring on the side, so that it is easily removed. Blocks from the lumber yard cost half a cent each, and are made of waste lumber.

The system, for us, is perfectly satisfactory.

* * *

TURKEY SHOOT A SUCCESS IN NASHVILLE

According to J. S. Bonner, secretary of the Nashville Rifle Club, their Thanksgiving turkey shoot held on the preceding Friday night in the club's gallery was a roaring success. Bonner himself won one of the turkeys with a possible score, an unusual performance for a club secretary. Seventy-one competitors participated in the re-entry events and there were 200 people present to witness the matches.

* * *

RIFLE TEAM IS FETED

The Oregon National Guard rifle team, that won the Infantry Match from the Regular Army at Camp Perry this year, learned what their comrades thought of them at a rousing reception given the team at the Multnomah County armory, Monday evening, November 3.

Approximately 700 officers and men were present for the occasion. Both bands were on the job and livened things up between acts. Following a brief lecture on rifle marksmanship by Major

Clarence McMurray, U. S. A., the commanding general presented each shooting member of the team with the rifle used by him in winning the match. On the stock of each rifle is a silver plate bearing the name of the man and the significance of the gift. The rifles are the latest type, without the cocking piece on the end of the bolt, a new feature designed to save the face from bruises as a result of the recoil.

Team officers were presented with new service pistols.

Major Fred M. West, the team captain, made a few remarks after which hot dogs and coffee were served. Following the refreshments the team witnessed a lively indoor baseball game between Company G, 162nd Infantry, and Battery A, 148th Field Artillery, won by Company G.

Members of the rifle team were also guests of the Portland Chamber of Commerce at a banquet given in their honor on October 21.

* * *

A GOOD TURKEY SHOOT PROGRAM

The United Shoe Machinery Athletic Association Gun Club Rifle Division staged a turkey shoot prior to Thanksgiving, and a consolation chicken shoot two nights later at Beverly, Mass., which were very well planned. The following program may be of assistance to secretaries who are working on similar events for Christmas.

United Shoe Machine A. A. Gun Club, Rifle Division

ANNUAL TURKEY SHOOT

Saturday, Nov. 22, 1924, 2.00 P. M.
Club Range

Open to:—Anyone.

Course of fire:—Five shots offhand and five shots prone.

Distance:—200 yards. Target "A".

Open to any rifle and any sights without glass.

Optional handicap. Tie scores to be shot off.

Entrant scoring a miss in the last two shots will be disqualified.

Any offhand position will be allowed and the sling may be used in both positions.

Entrance fee:—\$1.00. Entries will open the day that you receive this notice and close at 2.30 P. M. the day of the shoot. Entries may be mailed to Frank E. Thissell, care United Shoe Machinery Corp., Beverly, Mass.

One-half of the turkeys will go to high net scores, and the other half to high handicap scores. This gives each shooter two chances.

No shooter will receive more than one turkey.

Each shooter handicaps himself, before starting to shoot he names his handicap, this added to his net score will be his total score, if this total score is more than the possible he will be penalized two points for each one that he exceeds the possible.

The range will be open at 10 A. M. for practice, but only two sighting shots will be allowed after 2 P. M.

CONSOLATION CHICKEN SHOOT

Monday evening, Nov. 24, 1924, 7.00 P. M.
City Hall Range

Open to:—Anyone who does not win a turkey on the 24th.

Course of fire:—5 shots prone and 5 shots offhand.

Creedmore count (5.4.3.2).

Distance:—25 yards. Optional handicap.

Entrance fee:—25c.

* * *

COLLEGES PLEASE NOTE!

Northwestern University Men's Rifle Club desires telegraphic matches with any college or university team in the United States. Mr. Robert L. Anderson, 2909 Colfax Street, Evanston, Ill., should be addressed in connection with the proposed matches.

TURKEY SHOOT SUGGESTIONS FROM NASHVILLE

It affords me great pleasure to tell you that our turkey shoot was a wonderful success. It was announced in the paper Thursday morning and a reminder Friday morning. There were 200 people, ladies and gentlemen, present, and 71 participated in the three matches, leaving for the fourth match a small amount of cash to be divided 50%, 30% and 20% as "consolation" for the losers to shoot for. Everything possible was done to make the shoot fair for all and give the "outsider" a chance.

In the first event club members were restricted to the use of issue muskets, while the outsider was permitted to use any .22 caliber rifle with iron sights not belonging to a club member. None of the members had ever shot above 80 with the musket. This was the only shoot won by a member of the club. Captain Stark shot a 45; his daughter, Miss Anna Lee Stark, shot a 47; Miss Hazel Gentry shot a 47 also; and Miss Evelyn Stark shot a 48, which was tied by Mr. G. H. Ferguson, an outsider. These three ladies are members of the Girls' Rifle Club. Mr. Atchley shot a 49 and Yours Truly slipped up on a possible and won the turkey.

The second match was held for the visitors only, not permitting club members to shoot or lend their personal rifles. In this match Miss Gentry and Miss Evelyn Stark shot 48 each and Mr. Ferguson shot a possible 50.

In the third match, open to anyone with any .22 caliber rifle, we made our first and only mistake. Mr. F. B. Hill shot a possible 100 for Lieutenant Jones of the National Guard. Captain Stark shot a 99 for Mr. Brent and I shot a possible 100 for C. H. Warwick, Jr. In the run off Mr. Hill shot a 97 and won the turkey for Lieut. Jones.

We were criticized for this, and justly so, for it isn't fair to the man who knew no one in the club to ask to shoot for him.

The consolation was a tie between Hill and Stark, and it was so late they split first and second money between them. Joe Fisher took third money.

The purpose of the match and rules governing it were explained before the shoot commenced, and also the details which are as follows:

No one allowed to use other than metallic sights. No winner allowed to participate in another match. Club members not allowed to loan their guns, except in the third and consolation matches. No admission charged the spectators. 25c charged for each target fired on. Two sighters and five shot for record in the first and second matches; two sighters and ten shots for record in the third and consolation matches. None but the coaches allowed on the firing line. Targets were sold for each event. The guns were sighted in and no one allowed to change them.

In our next shoot for the Christmas turkey, scheduled for December 13th, no one will be allowed to shoot for anyone else. A joker target will be used for one event. This will be a standard U. S. N. R. A. 50-foot gallery target folded in half. Half of the inside will be blocked off and numbered from 1 to 10 indiscriminately, closed up and shot at so that no one can see what was made until the target is brought back and opened. This is similar to the joker target

explained in the November 15th AMERICAN RIFLEMAN. We believe it will be a good one.

Finally it is worthy of note that three men who didn't know there was such a club in existence have joined and others are considering it. Col. G. H. Morgan, of the Hume Fogg R. O. T. C., officiated, and was perhaps the most interested and enthusiastic one present.

Pardon this long harangue, but it couldn't be helped. Tell the other fellows—

1. Not to let anyone shoot for anyone else.
2. Not to let anyone change sights on a gun.
3. To make it as fair for the visitor as humanly possible.
4. To shoot for any money over and above the cost of the turkeys that it may not appear a skin game.
5. Cater to the ladies for they control the destinies of the men and their attendance at the weekly shoot.

Hoping that others may profit by our experience, we are

NASHVILLE RIFLE CLUB,
J. S. Bonner, Sec'y.

* * *

CUMBERLAND PLAYS GASPIPE GOLF

The members of this club were very much interested in the article by Lieutenant Weeks on the activities of the Lakewood Pistol Club, especially their mention of the Tin Can Match, which match was also originated by a member of our club and has proved to be the most popular and most profitable match that we have ever shot. In our case we shoot it outdoors and the cup holder is liable to challenge at any time, regardless of weather conditions. Our course is on quart tomato cans and varies from five shots from the hip at ten yards to five slow fire at 75 yards, our record so far is three hits out of five at these two extreme ranges. At this time the cup has changed hands seven times.

During the regular outdoor season this year we shot another match, that while it may not be original with our club, was voted as highly successful and will probably be repeated occasionally next season. This one we called, "Gaspipe Golf." The prize was a quantity of ammunition and as the name implies the conditions were aimed to simulate golf. Any weapon, ammunition, sights and pull were allowed. The targets were ordinary clay pigeons suspended over the ends of four-foot laths stuck in the ground. The course was shot over the local airways field, one set of nine stakes and pigeons for each entrant, set 100 yards apart around the field. The first shot was fired at the full distance, if a miss the shooter advanced 20 yards and tried again and so on until the pigeon was hit, the final advance was limited to ten yards from the pigeon from which distance the shooter must remain until he had broken that particular pigeon. As soon as a hit was made the contestant started upon his second bird at the 100 yards and so on until he had broken his nine targets, obviously the winner was the man who went around with the least number of shots. The winner averaged four "strokes per hole," but exactly half of the entrants made one hole in one, of which number, strangely enough, the winner was not one. After the shoot the club congregated at a nearby farm-

house for a regular country chicken dinner, which I suspect accounted for the 100% attendance at the shoot.

All our members are individually members of the N. R. A., but due to our inability to secure a satisfactory rifle range so far, we have not affiliated as a club, but hope to do so before another year has passed. We are affiliated with the U. S. R. A., and are quite fortunate in having good revolver range facilities. Our indoor range, the regulation 20 yards, is in the basement of our best bowling alleys and consequently affords other amusements for an occasional change, as well as having smokes and eats handy. We have two outdoor pistol ranges, one several miles from town on the land of a farmer friend, where we usually go on Saturdays and holidays, the other, where we are limited to .22 caliber firing, is within the city limits and was obtained through the courtesy of a local manufacturer and the police department. This latter range is within ten minutes' walk of the center of town.

Our club has made no great attempt for numbers, after several efforts in that line, we decided that a small number of congenial but regular enthusiastic shooters was to be preferred to a large membership list of more or less indifferent men.

CUMBERLAND REVOLVER CLUB,
A. H. Amick, Jr., Sec'y.

* * *

FOR SERVICES RENDERED

"For services rendered the county and community during the late war and previously, we are giving free quarters in the Duval County Armory including lights, heat, water and the free use of the gallery range. Outdoors we use the state rifle range at Camp Johnston."

The above extract is from a letter written by Mr. L. E. Bigelow, secretary of the Jacksonville (Florida) Rifle Club. Not every club is so fortunate in having the service it has rendered local guard units recognized. On the other hand, how many clubs have overlooked the most important possibility in failing to render any service to the community in which they live. There are bank messengers who need training, policemen who need range facilities, railway mail clerks who are looking for a place to use the guns with which the Post Office Department arms them, and National Guard units would be glad to get a chance to shoot sometimes besides the annual pilgrimage to the state camp. What has your club ever done to render this kind of service?

* * *

DENVER POLICE HOLD BIG PRE-THANKSGIVING SHOOT

That Denver cops are rapidly becoming adept in the use of small arms was demonstrated here just prior to Thanksgiving when the police force held its annual shoot for turkeys. Past records went glimmering and it was early apparent that only those who could plug the bull's-eye consistently would carry home gobblers. High honors went to Detective O. A. Carter and Patrolman Lee Raedel, who broke all previous marks by tying for first place with scores of 49 out of possible 50. A large percentage of those taking part in the shoot had scores of better than 40.

THE DOPE BAG



**A FREE SERVICE TO TARGET, BIG GAME AND FIELD SHOTS
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**Rifles and Big Game Hunting: Major Townsend Whelen Pistols and Revolvers: Major J. S. Hatcher
Shotgun and Field Shooting: Capt. Charles Askins**

Every care is used in collecting data for questions submitted, but no responsibility is assumed for any accidents which may occur

Alaskan Hunting

By W. G. Hansen

ON my return from a hunting trip in Alaska during the months of September-October, 1924, I noticed the inquiry of N. B., Johnstown, Pennsylvania, in the November 1st issue of THE AMERICAN RIFLEMAN, asking for information on game conditions and reliable guides. Perhaps the following will give some of the information asked.

First, one requires a hunting license. The hunting is now under control of the Department of Agriculture, Bureau of Biological Survey, in charge of Chief Alaska Game Warden, Ernest P. Walker, located at Juneau, Alaska.

The license fee for an American citizen is \$50. The license is not transferrable, and shall be valid only during the calendar year, and authorizes the killing of two moose, if killed north of latitude 62 degrees, three deer, three caribou, three mountain sheep, three mountain goats, and three brown bear, and the shipment of said animals or any part thereof; but no more of any one kind.

The joker in case of moose is if a moose is killed south of latitude 62 degrees, you are only allowed one. North of 62 degrees you are allowed two per season. Your license will permit of shipping the moose killed north of 62 degrees without any further charge. But if you kill a moose south of 62 degrees (one only allowed) you are required to obtain a special shipping license which will cost \$150.00 in addition to the regular fee of \$50.00 for the license.

In the case of shipment of any game trophies, every person exporting game or trophies must file with the customs office at port of shipment an affidavit that he has not violated the game laws, that the trophy to be shipped has not been bought or purchased, has not been sold, and is not shipped for purpose of sale; that he is the owner of the trophy, and in case of moose, whether the animal from which it was taken was killed north or south of latitude 62 degrees.

In hunting in the interior of Alaska from Fairbanks and in fact any place except the Kenai Peninsula guides are not required by law. On the Kenai one must have a licensed guide.

The Kenai Peninsula is the finest moose country on this continent. During four days in the moose

section of Kenai I saw not less than 300 moose. Mountain sheep, black bear and brown bear are also plentiful on the Kenai—no caribou or deer.

Henry Lucas and George Nelson were my guides on the Kenai Peninsula. Mail reaches them addressed to Seward, Alaska. They are two of the best fellows you ever want to meet or hunt with and are thoroughly familiar with the country and game, and you are sure to get anything you start for. They have a very fine, comfortable and complete cabin on Lake Skilak on the Kenai Peninsula. Also have complete outfits for the hunt. A guide gets \$12.50 per day, a packer, \$7 and a cook \$7; and food per day for one will run about \$5.

To reach the Kenai Peninsula country one leaves Seward by auto to Mile 18 on Kenai Lake or goes to Roosevelt Station via the Alaska Railroad from Seward, a distance of 23 miles to Kenai Lake. Here either at Mile 18 or Roosevelt you take a gas boat down the lake to Coopers Landing and the start of the Kenai River. Trip by auto to Mile 18 from Seward is \$10 per machine, on the railroad to Roosevelt fare is about \$1.50. Boat fare from either landing to Coopers Landing on lake is \$4 one way. You will find a fine roadhouse kept by a Mr. Lean at Coopers Landing, plenty of good food and comfortable beds at reasonable prices, as I remember \$1 per meal and \$1 per bed.

At Coopers Landing your guide will have his own boat to go down the Kenai River and shoot the rapids and into Lake Skilak a distance of 18 miles when Skilak Lake is reached they put on an outboard motor and run the dory across or down the lake to their main camp, or one can continue down the river and come out at Cooks Inlet across the peninsula. There is plenty of hunting after one reaches Lake Skilak and just where to go will be determined by what you want to get and who your guide is as they have their own cabins and headquarters located in different parts of the district.

My advice to a hunter going into this part of Alaska is to take your own rifle and ammunition, a good pair of glasses a couple of good blankets

or your sleeping bag, and your ordinary clothes. As you can buy just what you want in the line of clothing and other equipment at Seward at a figure that it will not pay you to ship in a lot of equipment, and you can get just what you need to fulfill the conditions of weather, etc., as you find it at the time, and you will find your guides ready to give you advice and help in a proper selection.

Horses are very scarce on the Kenai and all the hunting is done on foot, and the supplies are carried in pack sacks by the packers at \$7 per day. In coming out from this district if one does not continue down the river to Cooks Inlet and there connect with a boat for either Anchorage or back to Seward, you will have to walk the distance of 18 miles back up the river to Coopers Landing as it does not pay to line an outfit up the rapids.

Further in the interior on the Alaska Railroad you can find a fine fellow and most complete outfit in the person of Dan Kennedy. Mr. Kennedy has 26 head of horses, pack saddles, riding saddles, tents, cots, blankets, etc., and can outfit for any kind of hunting and for any length of time. There is a wonderful hunting country back of McKinley Park where Kennedy is located, the Kantishna District. One can find bear, sheep, moose, and caribou. Another good man in this districts is Ed Jern, Copper Mountain, Kantishna.

Out the Richardson Highway about 100 miles from Fairbanks is another fine hunting country at Donnelly Dome and Jarvis Creek country. A fine man and good guide with outfit is John Majdukovich, whose address is Richardson, Alaska. Also another good guide in this territory is William Eisenmenger, Fairbanks, Alaska. Any of the already named game can be had and plenty of grouse, ptarmigan, ducks and geese.

A good hotel at Seward is the Van Gilder, run by a regular fellow, Joe Badger. At Fairbanks you will find a good hotel called Alaska, run by Thos. H. Foster. The trip by boat from Seattle to Seward takes seven days and the fare one way including cabin and meals is \$66. From Seward to Fairbanks over the Alaska Railroad is \$30, plus about \$5 for over night stop.

Open Seasons on Game

MOOSE—

North of latitude 62, Aug. 20-Dec. 31.

South of latitude 62, west of longitude 146 September 1-December 31.

South of latitude 62, east of longitude 146, August 20-December 31.

Mountain Sheep—August 20 to December 31.

Mountain Goat—August 20 to October 31.

Caribou—August 20 to December 31.

Deer—

In Southeastern Alaska east of longitude 141 only those having horns not less than three inches long, September 16 to December 15.

Brown Bear—

South of latitude 62, October 1 to July 1.

North of latitude 62, no closed season.

Black Bear—September 1 to June 30.

Duck, goose, brant wilson snipe, black-bellied plover, golden plovers and yellow-legs—September 1 to December 15.

Grouse and Ptarmigan—September 1 to March 1.

Take fishing tackle as there are many fine trout streams. In rifle you can do no better and get no better results than with the '06 Springfield. It will stop anything in the Territory and one can always get plenty of ammunition of all makes at either Seward or Fairbanks.

Point of Impact

R. D. TALMAGE

IN the November 15th "Dope Bag," I noticed a question and answer under the heading "Sight Settings" bearing upon the point of impact of the 30-06, 180 grain and 220 grain bullets at 200 yards. It might be of interest to L. M. G., and possibly to others, if I be allowed to bear out Major Whelen's answer by an actual experience I have just had on this very matter particularly as regards barrel flip of which he speaks.

I have a brand new 30-06 Match rifle and it is extremely accurate, but it does show a very distinct flip with the different weight bullets in front of their so-called standard loads. This is by no means anything new, in fact it is an actual example of the theory we cranks hold on the subject, yet this particular barrel is the first and only of a great many 30-06's which I have had which really shows an appreciable difference in point of impact with standard loads at such short distances as 100 and 200 yards. I do a lot of group shooting, and usually use an inverted "T" at 100 and 200 yards; sometimes a four-inch bull at 100 and an eight-inch at 200. After trying out a new load on one of these inverted T's to see what its group will be regardless of sights and point of impact, I then "sight it in" (for theoretical or practical hunting purposes) usually using an eight-inch bull at both 100 and 200 yards. It has been my experience, after getting one of these so-called standard loads to group fairly central on the eight-inch bull at 100 yards, to find that it will pretty consistently keep within the same size bull at 200 yards. In other words, the sights once set the arm is right for all ordinary hunting ranges, except perhaps where one is letting go at a very small mark such as a woodchuck when the aim must be held very carefully. In the past this has been done with the 150-2700, 180-2650, and 220-2350; the latter two being "home loads" and chronographed at one time at Frankford Arsenal, and these three loads would all hold within the eight-inch bull from the same barrel.

Now comes along this new rifle. I tried it out the other day with the following: 110-3500 (Rem.), 180-2700 (Western), and 220-2450 (Rem.). The target coming with this arm showed a five-shot group measuring 1 3/16 inch wide by 5/8 inch high. A pretty nice group. This of course was with the new type machine rest at Springfield. My first tryout at 100 yards gave me a 3 1/2 by 2 1/4 with ten shots, 110 grain-3500 Remington factory, with crude forearm and elbow rest. My next try was a point of impact test with the 110 grain, 180 grain, and 220 grain, Remington, Western, and Remington factory loads respectively; 100 yards, above forearm and elbow rest, holding of course as near as humanly possible at the same spot on each shot, five shots each. 110 grains measured 1 1/2 by 2 3/4. The 180 grain grouped about 8 1/2 inches higher (!) and directly over the 110 and measured (including one wild out of the five) 4 1/4 by 2 3/4; deducting the wild one, the other four gave 1 1/2 by 1 1/2. The 220 grain was not very good for group measurement yet not so bad since the wide was in the vertical 1 1/2 by 4 1/4. The 220 grain was slightly to the left of the 110 grain group but somewhat mixed up in it. (Measurements taken from centers of widest apart points.)

The above groups were made on the inverted T. I then tried the same loads at 200 yards but had to use and eight-inch bull. I shot the loads in the same order but will state that the ten 110 grain and ten 220 grain all went into the eight-inch bull, centering slightly to the right, all mixed together and the twenty shots measured 4 1/4 wide by 6 1/4 high. The 180 grain shot about thirteen inches higher (again!), and only six of the ten went onto the target (target being rather small, paper measuring 23 inches wide by 29 inches high). These six 180's gave 3 1/2 by 2 3/4. The other four went over the top, two of the six on the paper clipped the top edge.

To sum up, things went rather contrary to theory in this case, yet not enough so to form in my own mind the fact that this grouping must have been due to these loads affecting the barrel flip, but somewhat differently than was to be expected. Theoretically the 220 should have printed lowest, the 180 next higher, and the 110 highest. While the rest I was using was somewhat of a makeshift, I have done a great deal of this sort of shooting and I believe that I was holding very consistently and that this contrary sort of grouping was due mainly to the manner in which these different loads affected this particular barrel. I am of course going to check up on this. If I find that this particular barrel consistently acts this way I would be inclined, were I to take it on a hunting trip, to use only one particular load in it for I know that with any one of these three loads at least it is about as accurate a barrel as one could wish for. Besides being interesting, it pays to make such tests with new barrels for it shows you just where you get off.

READERS of the Dope Bag will notice that the leading story this issue—Alaskan Hunting, was not written by any member of the magazine's technical staff; also that a discussion of point of impact by R. D. Talmage appears in this department.

This is a departure which the Editors believe is well worth while since these articles are the direct result of subjects called up by Dope Bag readers. Furthermore, THE AMERICAN RIFLEMAN proposes to continue this practice whenever comments from our subscribers upon subjects which have already been discussed, whenever new facts are submitted which are of general interest or of ballistic importance. If these comments are sufficiently numerous to warrant it, a separate column will be devoted to presenting them.

The Editors invite subscribers to send in such contributions as those appearing in this issue under the signatures of Messrs. Hansen and Talmage.

THE ASSEMBLING OF A SPECIAL BUILT MATCH OR HUNTING RIFLE

I AM a member of the N. R. A., and have a Match Springfield that I have shot perhaps 500 times, and have finally reached that period in my rifle shooting experience when I want a better stock on it than the 1922 pistol grip stock I put on some time ago, although I find this stock very good indeed for target shooting.

On account of my build I find that I need a stock with a 3/4 or 3/8 inch drop at heel for game shooting, and since my arms are short I find a 13 1/2 inch stock of about the right length.

Since target shooting and game shooting differs so much I am very strongly inclined to purchase from the D. C. M. a star gauged barrel and receiver as shown in the N. R. A. Price List at \$15.90, a bolt mechanism complete, the nine items first shown above the bolt mechanism in the price list and the nine items first appearing in the price

list below the same item of bolt mechanism, and send all of the same to either Hoffman or Griffin & Howe and have a circassian stock with a pistol grip 3 1/2 inches from cap thereof to trigger, a pistol grip circumference of 5 1/4 inches, and about eighteen inches in length in front of the trigger.

All the above items from the D. C. M. will cost me \$26.74 so that I can get out with about \$125 and have a game rifle that will fit me.

If you will advise me as to the wisdom of doing as above indicated I shall feel very grateful to you.

Does the .30 caliber barrel same outside dimensions as the .22 caliber barrel weigh more than the barrel that is now in my Match Springfield? Has the bolt mechanism been polished and smoothed up in the receiver so that the bolt will function as smoothly as the bolt in the selected Match rifles? A smooth working bolt is to be very highly appreciated when a big buck is separating himself from you at the rate of about 40 miles per hour. I am not using my .300 Savage on account of the hard-working bolt.

Would my best proposition be to purchase one of the Sporting Springfields from the D. C. M. and send it to the stock maker to be fitted with a new stock? In this way would I not get as smooth working action as in the Match Springfields? J. H. P., Ashburn, Ga.

Answer (by Major Whelen.) In general your ideas as to remodeling a Springfield are correct, but there are several disadvantages of buying separate parts. The barrel is not tested by firing. The parts are not completely assembled and smoothed up. The bolt may not be absolutely correct as to head space. When the parts are assembled they still require the services of an expert with the necessary tools and gauges to adjust them and smooth up for really satisfactory use.

I would advise that you purchase a sporting type of .30 caliber Springfield rifle with Model 1922 pistol grip stock and Lyman No. 48B receiver sight. This rifle has all the niceties of adjustment found on the National Match rifle—trigger pull is smoothed and adjusted, bolt is polished, bolt slide ways in receiver are polished, head piece is just right, rifle is tested for accuracy. You can then sell or trade the 1922 stock, and even if you scrap it you are out only about \$6. This rifle used to cost \$51.34 complete. Just what it costs now I don't know.

I would advise that you send this rifle to a private gunsmith with your specifications for new stock, or have it sent direct to them from Springfield Armory which can be done if you so direct. Would also advise that you have them, in addition to fitting the new stock, place one of their ramp front sight bases and Lyman gold bead front sight on the barrel in place of the Government fixed and movable base front sight studs, as this very greatly improves and enriches the appearance of the weapon. In conjunction with the new stock, a barrel band and sling swivels should be fitted, and a Whelen gun sling furnished. When you receive the rifle, should the bolt not work easily enough for you, simply coat all of the bolt except the locking lugs, with the finest grade of valve grinding compound and work same back and forth, cocking etc., with trigger pulled back, for ten minutes or so. This will polish all working surfaces of the bolt, and make it work with the desired ease.

The barrel on this .30 caliber Sporting type of Springfield is of the same outside dimensions and type as the .22 caliber Springfield barrel. It will weigh between one and two ounces more than the regular .30 caliber barrel. But it is beautifully tapered, and finished, and has not that ugly spline cut for the rear sight fixed base that the regular barrel has. Also it will save you a lot of money in not having to have the regular barrel turned down and smoothed up. I feel sure that it will be more accurate than the regular barrel would be after it had been dismounted from the receiver, and turned down and polished in a lathe.

MATCH AMMUNITION

I AM much interested in reloading the .30-'06 cartridge. I have some Hi-Vel powder coming from Camp Perry and would like to duplicate the 1923 National Match load. I have some Frankford cases and some 6° boat tail 170-grain bullets. How many grains of Hi-Vel to get about 2,700 ft.? I have some Winchester primers from the D. C. M. office. Will they be satisfactory? Would also like to charge for the 170-grain F. B. Frankford Y. M. for ranges up to and including 600 yards.

I have a Springfield .22 model 22-inch barrel, first class shape. By changing the firing pin from a double striker to a single, will it improve its grouping any? I know that you are a busy man and if you can find time to answer this it would be fine. E. F. S.

Answer (by Major Whelen). I have your letter of Oct. 6th. The proper charge of Hi-Vel powder for the Springfield, using the 170-grain 6° boat tail bullet is 45.4 grains, giving a muzzle velocity of 2,700 f.s., with a breech pressure of 47,200 pounds per square inch. This practically duplicates the 1923 National Match ammunition. This would also be excellent for 600-yard work, although I think that one can get just as good accuracy at 600 yards from a charge of 44 grains of this powder, and thus economize on the powder and get less erosion. Your Winchester No. 35 primers, or the Frankford Arsenal No. 70 primers as sold by the D. C. M. will be perfectly satisfactory, these two primers being identical.

I would not counsel your attempting to change the firing pin on your .22 caliber Springfield yourself. The location of the firing pin, its point of striking, its projection, and the strength of the mainspring have a lot to do with ignition and good accuracy in .22 caliber rifles. I understand that Springfield Armory has designed a new firing pin for the .22 caliber rifle, with a slight modification in the bolt head, and that this modification seems to give better ignition and hence better accuracy in the .22 caliber Springfield. I think that some time this winter this modification will be made available so that owners of the first type of firing pin can get the parts and make the change themselves. When this time comes undoubtedly the fact and all the details will be announced in THE AMERICAN RIFLEMAN.

Krag Gallery Loads

WILL you kindly give me all possible information on very light loads for the Krag, suitable for gallery practice? I wish to use, as far as possible material that is sold through the D. C. M. such as pyro powder advertised in the N. R. A. price list. I have not the facilities for making my own bullets so shall have to buy them. I have a small quantity of Hercules Hi-Vel on hand. Could you recommend a charge of this, suitable for gallery and also short range outdoor work?

What type primer would you recommend for these light loads? What do you think of the Krag carbine and ammunition as sold through the D. C. M.? C. K. W., Hollis, N. Y.

Answer (by Major Whelen). I have your letter of Oct. 3rd relative to gallery loads for the Krag rifle. Neither the Government Pyro powder nor Hercules Hi Vel powder are at all suitable for reduced or gallery loads. Both of these powders are essentially high pressure powders, and they do not burn well at all in small charges, and in fact will not do at all.

For gallery work a very light load is required. I would particularly recommend the Belding and Mull .30 caliber 87-grain bullet, with a powder charge of 8 grains weight of du Pont Sporting Rifle Powder No. 80. This should do good work in the gallery.

A more accurate and reliable load, but one that is rather heavy for a small gallery, although fine in the larger National Guard Armory galleries,

is the Belding & Mull .30 caliber 154-grain bullet, with 10 to 12 grains of du Pont No. 80 powder. I mention these two loads because you can purchase the bullets ready cast from Belding & Mull, whose circular I inclose herewith.

It is hard to beat a Krag carbine as a hunting rifle. They are extremely durable and very reliable, and shoot very well. But they are not at all target weapons. On the target range they are very much outclassed by the Krag and Springfield rifles. The carbine in good condition should keep its shots in about an 8-inch circle at 200 yards with good ammunition.

The Krag ammunition sold by the D. C. M., is good, accurate, and reliable target ammunition; not the best by any means because it is now getting rather old, but it is well worth the price asked for it.

The Government, by the way, is completely out of Krag carbines. You can obtain no more of them through the D. C. M.

The best primer to use in Krag loads of all kinds is the Frankford Arsenal No. 70, which is the primer sold by the D. C. M.

With the Government Pyro D. G. powder use a charge of 36 grains with the regular 220-grain bullets. Muzzle velocity 2,075 f. s. (in 30-inch barrel) and pressure 41,000 pounds.

With Hercules Hi Vel powder use a charge of 33 grains weight with the regular 220-grain bullet. Muzzle velocity 2,011 f. s. (in 30-inch barrel) and pressure 33,800 pounds.

GOOD LOADS FOR THE .38 S. & W.

PLEASE suggest a good target load for the .38 S. & W. Special, both mid-range and full loads.

In purchasing a Bond mold would you suggest a mold that will cast one 145 grain bullet and one 125 grain bullet? Suggest the best bullet for above mentioned loads. Bond molds may be had to cast 125, 145 and 160 grain bullets.

What about King's semi-smokeless powder for this cartridge and what is best primer for same?

All information and any suggestions you may offer will be greatly appreciated. W. M. G., Elmore Ala.

Answer (by Major Hatcher.) The Standard full load for the .38 Special calls for a 158 grain bullet, and for this purpose you can use Bond bullet No. B-358742, which weighs 160 grains. An excellent weight for mid-range is 125 grains. I do not recommend the 145 grain bullet for your purposes, as it is too light for full load and too heavy for mid-range.

With the 160 grain bullet, I should use four (4.0) grains of duPont Pistol Powder No. 5, or three and three-tenths (3.3) grains of Bullseye. For mid-range, use the 125 grain Bond bullet No. A-358615 with three (3.0) grains of duPont Pistol Powder No. 5, or two (2.0) grains of Bullseye.

King's Semi-Smokeless is a satisfactory powder for this cartridge, in loads of eighteen (18) grains weight FFG for the 160-grain bullet, and twelve (12) grains weight FFG for the 125-grain Mid-range bullet. With this powder use any black powder primer, such as Western No. 1½, Winchester No. 1½W, Remington No. 1, Peters No. 1½, or U. S. No. 1½ "US".

Krag Reloads

WOULD you kindly give me the following information if possible.

What is the approximate pressure of the following two loads in the Krag rifle and carbine, also the approximate velocity?

38 grains No. 16 220-grain Western bullet. MV2125 P40,000.

38 grains No. 16 170-grain copper jacketed Government bullet, flat base. M. V. about 2300 P about 36,000.

Is the first load a safe one in the Krag carbine in normal conditions using new Western shells? I have shot quite a number of the second load

and it seems that there is a bit more recoil than when using the 220-grain service issue shells. I have been wondering if 38 grains No. 16 behind the 220-grain Western bullet would be safe. Du Pont test on can shows 40 grains to be a safe load, but the maximum. Loads are weighed on Bond scales.

I reloaded a number of R. A. 17 shells (Krag) with 16 grains of No. 75. Also some with 38 grains No. 16, both behind the 170-grain Government bullet. In the No. 75 load nearly every shell broke just about half an inch in front of the head, while not a one I tried did with the load of No. 16. How would you account for it? Bullets were loaded so as to trench the lands in both cases.

Is there enough wood in the rough turned 1922 stock so that one can bed it to the Krag carbine, so as to give a greater than normal drop say one-half or three-fourths inch? I mean to bed to normal depth in blank at magazine and deepen at front end and finish the stock similar to the Remington model 30 as to forend.

Is the Western 220 grain bullet as used for the Krag and Springfield a boat-tail bullet or not? These I received could be entered quite easily into new Western cases for a distance of almost 3/16 inch and the taper was quite noticeable. I enjoy reading THE AMERICAN RIFLEMAN and get quite a bit of information and enjoyment out of the Dope Bag pages. C. E. P., Whittier, Cal.

Answer (by Major Whelen). In the Krag rifle the charges you mention will give approximately the following muzzle velocities and pressures:

38 Grains du Pont No. 16 powder, Western 220 grain soft point bullet—Muzzle velocity, 2,125 f.s., pressure 40,000 pounds.

38 Grains du Pont No. 16 powder, 170 grain gilding metal jacketed flat base bullet—Muzzle velocity, 2,300, pressure about 36,000.

The above velocities are for the Krag rifle. The carbine will give approximately 60 to 100 feet less velocity. Both charges are perfectly safe in all cartridge cases made since the war, and are probably safe in all cases.

When a case breaks with a separation half an inch in front of the head it is usually an indication that either the head space is too large, or the length of the cartridge case from the head to the shoulder is too small, or the brass is poor. It is quite remarkable that cases should have broken thus with the light charge of No. 75 powder, and that they did not break with the load of No. 16 powder. In the absence of further complete details I should prefer to withhold judgment on this and simply say I don't know why it occurred.

There is no such thing so far as I know as a rough turned Model 1922 stock. These stocks I think are made from the blank pieces of walnut on hand after the war for the manufacture of stocks for the Model 1917 rifle. These are just rough blank pieces of walnut, about two inches thick, sawed roughly to shape. I am not sure whether you can purchase these through the D. C. M., but if you could they are large enough for a gunsmith to make practically any size stock from them. Perhaps, considering all the red tape, it would be easier to purchase a rough walnut blank direct from R. D. Tate, Montague, California. Particularly you would save transportation on it. He might even be able to roughly turn it into shape so that you could get a stock for the Krag of your required dimensions if you will write him fully what you want, mentioning my name please.

So far as I know the Western 220 grain bullets are not boat tail in shape. It is possible, however that they may have slightly decreased the diameter of these bullets at their base as I know they think that by doing so they slightly improve the accuracy. I would not call any bullet with a less than 4 degrees, and with a length of taper shorter than three-quarters of a caliber a boat tail.

"MAGNUM" SHOTGUNS

I INTEND to buy a "young cannon" and have it simmered down to (1) the Super-Fox 12-gauge; (2) The L. C. Smith Long Range; (3) The G. E. Lewis' Magnum. I know that mechanically the Fox and Smith are about a toss up. How about the Lewis, will its breech remain tight, for a lifetime like either of the others would? How do these guns compare in balance and handling? How does the quality of steel in their barrels compare? Which of the three do you consider has the largest killing range? Will the Lewis handle our paper shells like the three-inch super X or Ajax?

I rather think that I am in love with the Fox. How does the Remington Heavy Duck load loaded with 44 grains Oval and $1\frac{1}{4}$ ounces shot compare with Super X (12 gauge) for pattern and killing range? G. F. J., Aurora, Minn.

Answer (by Captain Askins). I have never seen a Lewis or any other English gun in big bores that compared favorably with a Smith or a Super Fox.

I believe that any or all of these guns are amply strong for any pressure developed by factory loads. It is merely a question of recoil. I believe the balance would be a matter of the individual gun, one Fox might balance better than some Smith, but the reverse would be the truth of the very next pair picked up. The Lewis will handle an ounce and a quarter of shot very well, but is not so well adapted to the $1\frac{1}{4}$ ounce load. For the Smith and the Fox, I have both here, and while I have no means of measuring bore and choke yet it seems to me that both guns are bored precisely alike in every respect. The two guns shoot alike, too, just about a toss up, using three-inch Super X shells. The Lewis may be had chambered for a three-inch case, but the gun is bored narrow and should be confined to an ounce and a quarter of shot.

If you get the Fox in a good grade, say the C grade, but bored for Super X ammunition, you will have as good a gun as money can buy. Have the weight of the arm $8\frac{1}{2}$ pounds.

When shells are loaded with like amounts of powder and like quantities of shot, same powder and same shot, there should be no material difference in the output of one factory and another, say Super X, U. S. Ajax, Remington Heavy Duck load, and I think the Winchester and the Peters Company are bringing out the same load. Forty-four grains of du Pont Oval looks like plenty of powder to me, but powders vary in strength and the factory can be trusted to furnish the best load they know how.

CARTRIDGES WITH STOPPING POWER

I DESIRE to purchase the most powerful revolver made, that is as to "stopping power," and as to the model I have decided on the Colt Single Action Army, because it fits my hand best of all, but am unable to decide on the caliber. I put the matter up to the Colt, Remington and Winchester people, and the result was that the Colt people recommended the 44 W. C. F., the Remington people say the 45 Colt loaded with black powder, and the Winchester people say the 38 W. C. F. Now what am I to do?

The 44-40 and the 38-40 were never intended for revolver cartridges, and I note that on account of their large volume they cannot be loaded with Bullseye, or other pistol powders, also the 45 Colt revolver as now manufactured is bored for smokeless powder, and I would think that black powder shells would not give good results, besides Chauncey Thomas says that black powder as now manufactured is no good anyway.

Also I desire to purchase the lightest weight belt gun, using the most powerful cartridge. What would you recommend for this combination? Would not the Colt Police Positive Special and using the 38 S. & W. Special cartridge fill the bill? The larger frame revolvers are too large for my hand, or I would get the Colt Offi-

cers Model. Would the above gun, weighing 22 ounces jump much when using regular loads, and is not the grip much smaller than the Colt Officers Model 38?

Have always been interested in guns, but have never had the time and money to indulge myself, so I get most of my pleasure in reading the "Dope Bag," and similar articles. Have never liked automatics, possibly because I never used them much. Was with the Military Intelligence Division, Quartermaster Depot, Jeffersonville, Ind., during a period of the war, as a civilian employee, and the Sarge wanted to issue me a .45 automatic, but I declined and carried my own gun, a .32 S. & W. hand ejector with six-inch barrel. W. M. H., Howell, Tenn.

Answer (by Major Hatcher.) The best cartridges for the Colt single action are the .45 Colt or the .44 Special. There is no use considering the black powder load, as it is obsolete. It is true that the black powder load has a little more muzzle velocity and consequently slightly greater energy, but the difference is so small that it would never be of any importance in a practical way. The black powder load has too much recoil to be pleasant to shoot, and consequently most companies now load it with a reduced amount of powder, so that it has no more power than the smokeless load.

The .44 Special and .45 Colt have the same muzzle energy, in the smokeless load, which is 333 ft. lbs. I believe that the .44 Special is perhaps the better choice, as it is a more modern cartridge, and was designed especially for smokeless powder.

The Police Positive Special is a perfectly satisfactory gun for the .38 Special cartridge, but, of course, it is a smaller gun all around than the Army Special, or the Officers Model Target, and has a smaller grip. You need not worry about the jump, as it is not enough to bother you any. Of course it depends on exactly what you want, but I should think that the Police Positive Special would fill the bill.

A 10-BORE LOAD

BEING still an unconverted "Dodo" I shoot a ten-bore gun on sea fowl and I want the biggest powder and shot charge it is safe for me to use. My guns are Scott ten-bores about twenty-five years old, but very heavy and in first-rate condition. Kirkwood of Boston hand loads all my shells. My shot is $1\frac{3}{4}$ or $1\frac{1}{2}$ ounces with $4\frac{3}{4}$ drams of powder behind it. For the life of me I cannot remember what powder Kirkwood loaded last.

Now, what is your advice as to du Pont Oval? Will it benefit me any and if so, can you give me any dope as to the loads? Any information will be gratefully received. E. J., Boston.

Answer (by Captain Askins). It is surprising that you could get good work out of an ounce and a half of shot with standard powders. I couldn't. Certainly, du Pont Oval will be a big advantage when using heavy loads. The charge would be about 46 grains, though a bit of experimenting with your gun would be an advantage. The shot charge would likely be an ounce and five-eighths, loaded in three-inch cases. Good felt wadding will do or a combination of felt and corktex. You can expect both higher patterns and higher velocities.

If you want still higher patterns you can try the plan I use if you like. Take the top wad and using a sixteen bore wad cutter cut a hole in it, put a twelve bore card board over this hole and load your shot. Under pressure the card board will sink into this hole a short distance and pressures will be relieved while the load is starting and passing through the cone. Patterns are usually increased five or ten percent, though it may require some experimenting and shooting at a target to balance the load. Pressures are reduced about half a ton under this scheme.

I think the ten-bore load will come by and by. It is merely a question of demand.

The 250-3000 and 25-20

A. A. BROOKS

THIS contribution may go well in the "Dope Bag" as a companion to Mr. L. P. Holmes' article on the .250-3000 Savage in which I was much interested.

I shot a .250-3000 bolt action with a Lyman N. 54 rear sight and a Special V-M front sight for a season on woodchuck. I tested this rifle out at 150 yards with Remington, Savage and Western 87 grain ammunition. All three shot to the same place, but I think I got a little better accuracy out of the Savage. The Western shells all split at the neck and about three out of five would leave the bullet in the chamber if extracted without being fired. The Savage shells occasionally missed fire probably due to a short firing pin. The Remington stuff was very reliable.

I found this rifle extremely accurate, about a four-inch circle at 150 yards. However, it was so light and short that unless I happened to be feeling just right I couldn't hit anything with it. Just note that this was all me and not any of it rifle. There is one out about it. It will jam occasionally. This could be largely prevented if the makers would let the breech of the barrel fit the bolt head say to within 1-16 of an inch.

When the Savage people brought out the 25-20 Sporter, I swapped the .250-3000 for one. It is no use for what I want as with either Remington or Savage high velocity (60 grain, 2,200 ft.) ammunition, it will only do about an eight-inch circle at 150 yards and the two brands of ammunition don't go to the same place within about eight inches.

It looks as though I would have to go back to the .250-3000 and if I do I'm going to try to get a long heavy barrel on it. So far everyone wants to sell me \$100 worth of rifle and \$100 worth of fancy work and I don't want the fancy work.

I see quite a lot about reloads at reduced velocity for this rifle. Does anyone know anything about reloads with light bullets but practically full velocity? The low velocity stuff will ricochet and I want mine to come to pieces when they strike the ground. On the other hand, a 30-grain bullet at high velocity would kill woodchucks just as well as the big one, in fact the 60-grain, 2,200 ft. 25-20 cartridge will stop a 'chuck better than the 87-grain .250-3000.

THE 256 MANNLICHER-SCHOENAUER

I HAVE a pre-war .256 Mannlicher-Schoenauer, 18-in. barrel carbine of very fine finish and a very smooth working gun. Do you consider this rifle suitable for all-around shooting on American game with the 160-grain bullet? I have owned an N. R. A. Springfield Sporter, but found it too heavy. What groups should this gun make at 100 yards with muzzle and elbow rest and what Lyman sights do you recommend on above gun? How is the bolt dismounted? I understand it can be done without tools. Will this gun stand up under severe use as well as a Springfield? J. A. F., Brocton, N. Y.

Answer (by Major Whelen.) The .256 (6.5 mm.) Mannlicher-Schoenauer rifle is an excellent weapon. It is amply powerful enough for any American game, is accurate, reliable, and durable. It will stand up under very severe usage. It is quite a popular weapon for medium small game all the world over. It is perhaps more popular in other countries than here in America. In America we study and examine rifles more critically than in any other country, and we have more experience with all makes, and are better able to make comparisons.

We have only two criticisms for the Mannlicher-Schoenauer action in general. The forward location of the bolt handle makes this rifle rather difficult to manipulate while keeping the butt to the shoulder in rapid fire in comparison with Mauser and Springfield bolt actions. The flat bolt handle is not grasped as easily, and is apt

to slip out of the hand during operation, particularly if the hands be wet with perspiration, or if gloves are worn. Also the flat handle does not permit of the bolt being pounded open and shut with the palm of the hand should a cartridge or fired case stick a little. In all high intensity rifles one now and then gets a hold of a cartridge the head of the case of which has not been annealed quite as hard as it should be. This case will stick in the rifle a little when fired. One little blow with the palm of the hand on the rounded knob of the bolt handle of the Mauser or Springfield would free it instantly. A similar pound on the Mannlicher handle would probably cut the hand. Thus the Mauser or Springfield permit of more "beef" being put to the operations. I give these two criticisms so you may have every side of the case.

No rifle will shoot better than its ammunition, nor can any rifle be aimed better than its sights. The Springfield ammunition has been through years of experiment and improvement until now it is the best ammunition in the world. Using the best of hunting ammunition, a good shot with the Springfield should place ten shots within a 2½ inch circle at 100 yards. With a Mannlicher-Schoenauer 6.5 mm. rifle with 22-inch barrel, and the best of Lyman sights, the group at 100 yards should be about 2¾ inches in diameter. With the 18-inch barrel the sighting radius is so short that errors amount to more, and with such a rifle and open sights a good marksman would probably get about 3¼-inch groups at 100 yards.

The best ammunition for game shooting is that loaded with 160-grain bullet. It is the length and weight, and stiffness of this bullet which makes it such a good killer. The American ammunition with this weight bullet will give from 2,150 f.s. to 2,200 f.s. in your 18-inch barrel. The ammunition with lighter bullets, but with higher velocity is not nearly as good in killing power as the heavy 160-grain bullet. I have one friend who has killed over eighty grizzly and big brown bears with one Mannlicher rifle with 160 grain bullets, as well as hundreds of other species of big game including many moose. All this with one rifle covering a period from about 1895 to today. I shot this rifle about four years ago. It was still quite accurate, and perfectly satisfactory.

To take out and disassemble the bolt of the Mannlicher-Schoenauer rifle:

Open the bolt and draw it out of the receiver, holding down on the bolt catch on the left side, rear, of receiver. Take the bolt in the left hand and hold so that the firing pin nut stands upwards. The firing pin spring then has its stress released slowly by turning the cocking piece; the flag shaped handle of the safety lock is pressed against the cocking piece and is turned from left to right through 180 degrees; the firing pin nut is turned left through 90 degrees, and is drawn off the end of the firing pin. The flag-shaped handle of the safety lock is then again turned to the left, and the cocking piece removed together with the safety catch. After this the bolt head is turned to the left until the ejector and bolt handle stand in line. The bolt head and the firing pin, pressed out of the bolt by the force of its spring, can now be removed. To reassemble the same procedure is followed in the reverse order.

In order to remove the cartridge carrier in the magazine, the cover plate at the under side of the rifle is turned until it leaves the grooves in the body. This can be done by first pressing in with the point of a bullet on the flat spring found at the bottom of the cover release hole, and turning at the same time.

COPPER AND BRASS WADS

IN your article in the March number of *Outdoor Life*, on "Ballistics of the Shotgun," I note the details of loading to get these results and wish to inquire if it is possible to obtain the required ammunition for such loading as follows:

Copper wads, brass wads, shot molds.

Our canvasback shooting is always out of ordin-

ary range and if you would give me such data I could arrange to do loading until I had struck the right balanced loads. In your opinion what would be a balanced load of number four and also number two shot for a ten-gauge, three inch chamber L. C. Smith, weighing a trifle under ten pounds? J. G. L., Minneapolis.

Answer (by Captain Askins). The copper wads have never been made except for a twelve bore gun, neither the brass wads nor the shot molds. These were all made by E. M. Sweeley of Twin Falls, Idaho, and while you might write to him, I do not in the least believe that you can get such things for a ten-bore.

You might try this scheme which Sweeley uses sometimes, and so do I. Load 46 to 48 grains of du Pont Oval—I'd start with 46 grains, weighed, because I do not know the exact strength of the particular powder which you may get a hold of. Put a felt wad next the powder, then a corktex, 5/16 and then a black edge ¾. Before putting down this last wad, take a wad cutter of sixteen bore and cut a hole in it. On top of this wad, covering the hole, place a twelve-gauge wad, rather thin twelve, and load the shot as usual. Put in 1½ ounces of number four or two shot or three, chilled shot.

This scheme of loading has a tendency to relieve initial pressures, and it will require a little more powder and a little more shot to balance the load than it would if loaded factory style. You ought to get patterns and range.

MID-RANGE LOADS

I WOULD like to have some information in regard to the various factory loads that can be used in a S. & W. .38 Special target revolver. The makers of this gun advise the use of the .38 Special cartridge only, and in case lighter loads are desired, the .38 Special Mid-Range. The Colt Army Special is chambered for the same cartridge but their catalog tells us that the .38 short and long Colt cartridges can also be used. Of course any cartridge that will go into the cylinder can be fired but I would like to know just what results to expect. Is the .38 short Colt only made with outside lubricated bullet? Does the .38 long Colt have more velocity or greater energy than the .38 Special on account of its lighter bullet? What is the powder charge of these cartridges (long and .38 Special)? Which would be more effective for general side arm use when the extreme accuracy of the .38 Special is not required? In using the short cartridge with smokeless powder is there any danger of pitting or burning out the chamber as happens when .22 smokeless shorts are used in a rifle chambered for longs? Would prefer to use the short cartridge for just banging around as it is cheaper than the mid-range cartridge but did not know how the bullet would work on account of being outside lubricated.

Any information you can give me on the possibilities of this gun and its various loads will be greatly appreciated. P. A. W., Chambersburg, Pennsylvania.

Answer (by Major Hatcher.) In addition to the regular full charge .38 Special cartridge, all of the cartridge factories make a mid-range cartridge with a wad-cutter type of bullet for mid range use. For very short range work, the Remington Company also puts out a gallery load with a round ball of seventy grains weight, and a small load of black powder.

The .38 long Colt can also be used in any .38 Special revolver with very good results. There is, of course, a slight additional jump of the bullet in the cylinder, owing to the fact that the chamber is somewhat longer than necessary for this cartridge; but I have not found this to make any practical difference, as very good accuracy is obtained.

I have never heard of any difficulty with pitting of the cylinder in using the shorter cartridges in the .38 Special, although, of course, the point just in front of the mouth of cartridge case is the place where corrosion will first be

noticed if the gun is not properly cleaned after shooting.

The .38 short Colt is only made with the outside lubricated bullet, and it is nothing like as good as the .38 long Colt, although it can also be used if desired.

The .38 long Colt has a 150-grain bullet with a load of three and five-tenths (3.5 grains of Bullseye, giving a muzzle velocity of 772 foot seconds, and a muzzle energy of 198 foot pounds, when fired in the Colt Army Special.

The .38 Special has a 159-grain bullet with three and six-tenths (3.6) grains of Bullseye, and gives a muzzle velocity of 833 foot seconds, and an energy of 243 foot pounds, in the .38 Colt Army Special.

You will see that the .38 Special is more effective from every point of view than the .38 long Colt.

The best cartridge to use for just banging around, is the .38 long Colt, as it can be bought from the Director of Civilian Marksmanship for \$10.00 per thousand.

BULLETS FOR THE 250 SAVAGE

I HAVE been trying to buy 1,000 87-grain, full metal jacketed bullets for my .250 Bolt Savage. To date I have had one reply, from many firms, and they ask \$27 a thousand for their bullets. This seems to be just about enough to prohibit me from using that pet load of 12-grain No. 80 powder. In fact I would have little use for the gun. Can you give me any information in regard to the price of these bullets. Was just ready to purchase Bond tool, and have Ross King tune up the trigger pull also fix the Stevens so the 54 Lyman would give good results. But I'm about to give it up. I like the gun fine. Had wonderful results with full loads, but ground squirrels don't need so much power. The last one I hit, I found the skin. What would you suggest? I can mold bullets sure, but I want better accuracy. Have been using a 22 Long Rifle, but you know my results; hit often but lag few. Would you keep the Bond mold and use a cast bullet? You know. R. H. B., Venice, California.

Answer (by Major Whelen). I am very sorry to say that I do not know where you can get 87 grain jacketed bullets suitable for use in the .250-3000 Savage rifle for less than \$2.70 per 100, which is the regular retail price. The Western Tool and Copper Works, Station G, Box 57, Oakland, Cal., make excellent bullets at this price, and as they are much nearer to you than the other makers there should be a saving on transportation.

To economize, it seems to me that the best way would be to obtain a mold from the Modern Bond Company, or Belding & Mull, and mold your own bullets. This will be an economy in the long run, but it requires a quite extensive investment in tools at the start—bullet mold, re-loading tool, melting pot, dipper, lead and tin, and a lubricating and sizing machine. The latter machine I believe to be absolutely necessary. I have never seen bullets made which could anywhere nearly approach in accuracy the metal cased bullets without the use of this machine for accurately sizing and lubricating the bullets. Even after you have cast enough bullets to show a saving and to write off the cost of your tools, you will still find that if you charge your time and labor at what it is worth, that the cast bullets will still cost you very nearly \$2.70 per 100. This cost is one of the reasons for the great popularity of the .22 caliber rifles.

But really, when you come right down to it, is this \$2.70 a hundred such a prohibitive price? It makes your ammunition cost approximately \$4.50 a hundred rounds if you already have the fired cartridge cases on hand. A whole day after ground squirrels might average you fifty shots. Thus your day's sport has cost you about \$2.25. This is pretty cheap for a day of good sport as things go nowadays. A day at the traps, or a day in your car, would cost you more.

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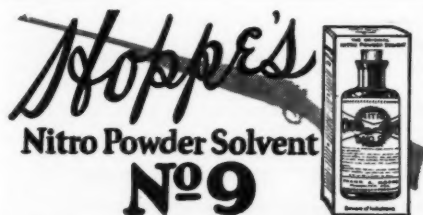
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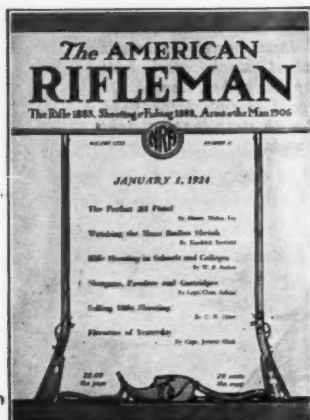
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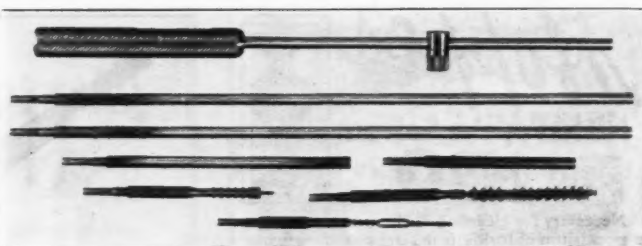
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FOR SALE—300 Savage with 410 barrel, new \$45. Remington pump, 12-30, full, A-1, \$32.00. Lefever double hammerless, 10-30, Damascus, good, \$16. 1895 Winchester, .35 cal. good \$17.50, 1890 Winchester 22 long rifle, fine, \$12.50. Winchester 22 automatic, fine, \$16.00. Marlin pump, 25-20 hi-speed, fine, \$17.00, 1895 Winchester, 38-72, receiver sight, A-1, \$13.00. S. & W. 38 Special, good \$14.50. Colt revolvers, (Bisley) A-1, \$23. Officers Target, 38-7½, pearl stocks, A-1, \$33.50. Army Special 32-20 fine, \$16. New Service 45-7½, good, \$17.50. Single action, 32-20, 38-40, 44-40, 45, serviceable, \$14.50 each. Automatic .38 pocket, fine, \$17. Automatic .45, good, \$15.00. Ray Nelson, Roy, Utah. B

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FOR SALE—Caliber .45. Model 1909, U. S. Army, double action revolver, condition very good, barrel O. K., \$15. Colt Officers Model, 38 Special, practically new, 6-inch barrel, latest model, \$30. A. L., care *American Rifleman*.

FOR SALE—One Sporting Springfield 24-inch barrel, \$50. One Sporting Springfield, 30-inch barrel, \$60. Both guns in perfect condition. W. R. McCay & Son, 39 Morton Street, New Castle, Pa. A

FOR TRADE—English setter bitch, 4 years old, for 1903 Springfield star gauged or Remington 12 ga. automatic. H. D. Pardue, Craigmont, Idaho. 419

FOR SALE—2,000 antique firearms at reasonable prices. Send six cents in stamps for 24-page price list. Let me know your special wants along any line of antique firearms. I am always anxious to buy single specimens or entire collections. Joe Kindig, Jr., 336 West Philadelphia Street, York, Pennsylvania. Z

FOR SALE—Krag carbine, 1909 model, perfect, \$18. Hal Anderson, Buick, Minn. 427

FOR SALE—44 S. & W. Special, 6½-in. blued, fired less than 50 times, in practically factory condition, M. O. for \$24. S. & W. model '91, ivory bead front sight, good condition, M. O. for \$10. Alec W. Gordon, Ambassador Hotel, St. Louis, Mo. 421

For SALE—One Model 52 Winchester and Stevens 368 scope. Fired only 100 times, like new. Price, \$55. Will trade for good pump 12-gauge, 32-inch trap gun or single trap gun. Wm. F. Smith, 5619 N. 4th Street, Philadelphia, Pennsylvania. Y

FOR SALE—Iver Johnson, .410 single, new, \$6.50 H. & R. revolver, (.38 S. & W.) nicked, target grip, fine, \$4. Patterson Colt rifle, good except rammer missing, \$62.50. C. A. Carpenter, Box 332, Lancaster, Pa. 455

FOR SALE—Sharps carbine, .52 caliber linen cartridges, vertical breech block, oil finished stock, new condition, with 100 cartridges and caps, also 100 extra caps. Price, \$6.50 f.o.b. C. E. Tyler, 18 Ware St., Lewiston, Me. 446

FOR SALE—Two new Model 52 Winchester, \$35 each. One .22 N. R. A. Savage, \$10. One No. 14 Stevens 22, with scope, \$20. One 30-in. barrel, 32-40 Winchester, \$20. One .44 caliber Sharps rifle, \$5. Write for particulars. E. F. Burkins, 2606 Washington Street, Wilmington, Delaware. 445

FOR SALE—363 Savage, \$22. 30 Winchester rifle, extra 30, 25-20 Marlin lever action, \$15. 38 S. & W. Special 6-inch barrel, extra 4-inch barrel, Heiser quick draw shoulder and belt holster, Ideal No. 3 double adj. tool, 38-44 mold, \$39. Guns good, revolver excellent. H. Z. Halliwell, Schroon Lake, N. Y. 400

FOR SALE—Stevens 12-ga. bbl. for No. 520 repeater, complete with magazine, slide and handle complete as in new condition, \$12. 12-ga. bbl. of Damascus steel for Spencer repeating shotgun, nearly new, \$10. G. H. E. Parker in new condition, 20-ga., \$80. J. P. Sauer over-and-under rifle and shotgun, 16-ga. and 9.3 mm. lower rifle barrel in new condition, very fine engraving, with cartridges, \$150. 7 mm. Mauser Espanol, made by Loewe of Berlin, \$22. 45-70 Remington-Lee Sporter, \$20. 30-30 Remington-Lee Sporter, \$30. Fine Gerard telescope sight with mounts, \$20. 8 x 40 Emil Busch German army field glass binoculars, individual eyepiece focus and pupillary adjustment, with case, \$9.50. 12-ga. Winchester lever action, repeating shotgun, open, fine for quail, \$18. Winchester 7.62 Russian cal. 1895 Model as issued, not a converted rifle, \$17. 50-110 Winchester 1886 Mod., full octagon barrel and full magazine, Lyman rear peep sight, \$18. 303 Enfield, 1914 Model, similar to 1917 30-06 in appearance, \$17. Please give second choice. All goods promptly shipped upon receipt of remittance. Harry Farley, 16 Jefferson Ave., Maspeth, N. Y. 454

ANTIQUE AND MODERN FIREARMS (new and used) sold, exchanged, and bought. Large stock—reasonable prices! Stephen Van Rensselaer, Peterborough, N. H. C

FOR SALE OR TRADE—Krag Sporter, dark walnut stock and forend, hand carved and checkered, with rubber recoil pad. Very accurate. Cost \$30. One dark walnut stock for Model 52 Winchester, hand carved, cheek rest, fancy forend, checkered throughout. Cost \$35. One 20-gauge 1912 Winchester, trap grade. Two barrels, raised matted ribs. Cost \$162. All leather cowhide case for above 20 gauge. Cost \$20.00. WANTED—12-gauge, 1912 Winchester standard, tournament or trap grade. Also pair Paul Weiss Alpine binoculars, 8-power, best grade. Boot where boot belongs. Frank Z. McColloch, Piqua, Ohio. 452

SPORTSMEN EXCHANGE—We buy, sell and exchange guns, rifles, revolvers, high-grade rods and reels, field glasses, cameras, watches. Highest prices paid for old gold, silver, platinum and diamonds. Expert watch repairing. Send the article with a letter, and we will make you our best offer by return mail. E. Wanger, 515-R Ludlow St., Philadelphia, Pa. 449

FOR SALE—BH grade Parker 20 factory new 28-inch barrels, 6 pounds, 13½, 2¾. Silvers pad, \$155. 25-35 Winchester S. S. 26-inch No. 3 nickel steel barrel, double set triggers, checked stock and forearm. No. 2 five-power Malcolm scope Winchester mounts, Bond tool, 200 shells, 1,000 bullets, new, \$40.00. G. E. Littlefair, Fort Worth, Texas. E

FOR SALE—Guns and pistols from matchlock to cartridge. List free. WANTED—Kentucky flintlock rifles, Pettingill 44, Darling brass barrel pepperboxes, Walsh 12-inch, Lindsey two hammer, Noel ten-shot, Elgin percussion cut-lass pistol, Alsop, large pistols and revolvers, with ivory or pearl stocks. All fine. The Spencers, Lebanon, Ohio. 441

FOR SALE OR EXCHANGE for firearms. National Sportsman magazines, 1909 to 1924; Field and Stream 1914 to 1924. Forest and Stream, 1917, 1918, 1924, Outer's Recreation, 1923, 1924. Please make an offer for the lot. Earlon E. Foss, R. R. No. 1, Box 75, Rochester, New Hampshire. 447

FOR SALE—A few '03 Springfield and m. 95-96 Krag walnut sporting stocks, accurately finished inside and out, ready for sandpaper. Satisfaction guaranteed. Springfield, \$13.50. Krag, \$10.50. A. J. Koshollek, Stevens Point, Wisconsin. 451

WANTED—Ballard single trigger action in perfect condition, barrel of no account, action must be perfect mechanically, and reasonably priced. Give detailed description. R. Mosteller, Box 975, Columbus, Ga. 450

FOR SALE—M. L. Combination gun, .44 rifle, 12-gauge shotgun, 30-inch twist barrels, by L. Hollis & Sons, London. Was a high-grade gun, in serviceable order, \$15. A. R. Farnham, Berwyn, Md. 438

WANTED—303 Savage bullet sizing and muzzle expanding chambers for Ideal tool. A. W. Bedell, Fairbault, Minn. 448

WANTED—American Rifleman, January 1st, 1924 number. Jack Axtell, McCall, Idaho. 439

FOR SALE—45 caliber, new service target pistol, 7½-inch barrel, new condition, \$30. 38 special Officers' Model, equal to new, extra pair of ivory grips, \$30. 22 caliber Colt Automatic with attachment for silences, \$20. 32-44 Russian, S. & W. single action, \$25, fine condition, would make fine gun rechambered for .38 special. 22 caliber, single shot, S. & W. target pistol, 10-inch barrel, Patridge sights, brand-new, never fired, \$15. These are all in store condition, barrels perfect, bluing intact. Bond reloading tools for .38 special and .45. Winchester single shot, .25-25 caliber and .30 Krag, two barrels, both No. 3 barrels in same action. Lyman 103, rear sight on tang, brand new, never targeted, \$50. First money order gets same. W. M. P. Batts, care R. J. Fitzsimons Corp., 75 Fifth Ave., New York City. 472

FOR SALE—S. A. Colt 45, 7½-inch new barrel and cylinder, wood grips, factory overhauled and refinished good as new with "Ideal" reloading tools in good working condition. All for \$25. Krag Carbine in good condition, 420 cartridges, \$15. Weiss binoculars, 8-power, almost new, factory condition, cost \$55, sell for \$35. Gov. Springfield .45-70, 26-inch barrel, fair condition, accurate, with 125 cartridges, ideal loading tools for 405-grain bullet, \$7. M. O. Evenson, Route No. 3, Wahpeton, N. D. 469

FOR SALE—BALLARD RIFLES AND OTHER OLD TIME MID-RANGE RIFLES, SUCH AS REMINGTON, REMINGTON-HEP, BURN, WESSON, SHARPS, AND OTHERS FOR SALE. ALSO ANTIQUE PISTOLS, REVOLVERS, AND EDGED WEAPONS IN GREAT VARIETY. STEPHEN VAN RENSSELAER, "THE CROSSROADS," PETERBOROUGH, NEW HAVEN. 470

FOR SALE—120 duplicate pieces from my collection including military muskets, rifles, carbines, and pistols, Civil War revolvers, other pistols and revolvers, Duelling sets, 12 priced and 6 unpriced sale catalogs, U. S. Cartridge Co. catalog of Lowell collection, a Berlin North pistol, a lot of firearms manufacturer's catalogs. J. C. Hervey, 880 Main St., Worcester, Mass. 464

FOR SALE—25-20 Winchester repeating rifle, model-1892. Good order, round barrel, Marble's folding rear peep on tang, \$15. Remington action pistol 22 caliber, 11-inch barrel, \$7.50. Colt's .45 auto. magazine, 50c. R. L. Proffitt, Proffitt's Bakery, North Salem, Ind. 463

FOR SALE—One Bisley Model Colt, 7½-inch barrel, checkered ivory stocks, specially chambered for 45 auto ctgs., brand new, \$45. 38 Colt Military Auto., 6-inch barrel, new checkered walnut stocks, Patridge sights, \$27.50. A. L. Steitz, Warehouse Point, Conn. 468

WANTED—At reasonable cash price, cap and ball revolver, new condition, also reloading tool for .38 Special S. & W. Have good violin to exchange for good rifle or shotgun. Norris Richardson, Hathorne, Mass. 465

WANTED—Standard make double barrel hammerless 12-gauge, and Remington S. S. Pistol action, reasonable for cash. W. H. Delbruegge, Box 551, Bend, Oregon. 462

FOR SALE OR TRADE—Colt automatic target pistol, new and perfect, \$25, or will trade for Winchester 5-A scope with mounts. J. F. Springer, 402-9th St., Wellsile, Ohio. 466

FOR SALE—One Zeiss 8 x 30 prism binocular. Used but in perfect optical and mechanical condition. Priced cheap. R. D. Talmage, East Hampton, N. Y. 442

WANTED—Bullet mold 20-gauge round ball, used clay pigeon trap. Both must be cheap. Floyd Davis, Charlemont, Mass. 467

FOR SALE—Winchester Musket 87 .22 Long Rifle, with N. R. A. sling strap, \$15. Gun crank condition. R. M. Blackman, 311 Fremont St., Waterloo, Iowa. 435

FOR SALE—Two Russian rifles, 7.62 mm., remodeled stocks, new, \$10 each, with 90 cartridges. L. G. Lasater, 1107 Syndicate Trust Bldg., St. Louis, Mo. 458

WANTED—45-90 solid frame model 1866 Winchester, also Maynard rifle any caliber, also model 1891 single action S. & W. revolver. G. L. Lehle, 3810 Broadway, Chicago, Ill. 457

WANTED—New, in factory grease, .22 cal. B. S. A. No. 12, or .22 caliber late model Winchester musket; also powerful spotting scope, perfect. What have you for cash? No fancy prices considered. W. H. McCormick, 149 Church St., New York City. 474

FOR SALE—Winchester Musket, cal. 22 L. R. with sling, cheek piece, and 4B Winchester telescope, practically new, \$40. Colt Police Positive, cal. 22 L. R. target revolver with holster, brand new, \$24, bargains. Chas. Richmond, Jr., 10 Williams St., Bradford, Pa. 456

FOR SALE OR TRADE—Stevens 414, Lyman sighted, new. V. H. Parker, 12-30, extra 26-inch barrels, high grade Le Fever 12-28, 6½ pounds, very fine shape. Would like good 20-gauge, revolver or .22 auto. Write for full description. H. A. Dewar, Amsterdam, N. Y. 437

FOR SALE—New guns, factory grease and cases, Ithaca Field Hammerless 12 and 16, \$33. Colt New Service .45 and .44, any length, \$29. Savage Bolt .250-3000, \$45. Remington Auto-Loading 25 and 35 \$54. Write your wants. M. H. Decker, 1306 Indiana Ave., LaPorte, Ind. 440

FOR SALE—Colt New Service revolver, .45 ACP, new condition, \$25. 216 MC .45 ACP cartridges in clips, \$5. Three Remier variometers, \$5 each. A-K 2-step amplifier, \$10. Sodion set, less tube, \$10. N. C. Pierce, 64 Oak St., Norwich, Conn. 443

TRADE—New .38 Special Colt double action, 6-in. barrel, ivory grips, highly engraved, for 12 gauge Remington automatic or .25 caliber Remington automatic rifle. 38 S. & W. Special Military, square butt, 6-inch barrel, perfect condition for 22-32 S. & W. or Colt target revolvers. Your guns must be in perfect condition. P. A. Shepherd, 393 K. S. A. C., Manhattan, Kan. 444

FOR SALE—Adolph Mauser .250-3000 Savage, 20-inch raised matted rib barrel, double set triggers, fine checkered pistol grip and forearm, cheek piece, trap butt plate, metal parts finely engraved with game scenes. Stock hand oiled finished and carving of unique design. Price \$125. Might be interested in Springfield Sporter as part payment. H. Crofut, Old Forge, N. Y. 434

FOR SALE—32 S. & W. hand ejector, renickled, 6-inch, \$12.50. 25 Stevens Off Hand, perfect, \$8.50. 22 Stevens Tip-up, \$2. Allen top hammer pistol in case with accessories, \$7. Baker (British) .38 pcn. revolver and outfit, perfect, in case, \$15. British .44 Bull Dog rev., good, \$3. Two .38 Hood R. F. revolvers, \$3 and \$3.50. 38 Smith R. F. revolver, \$3.50. 32 and 38 S. & W. single action C. F. revolvers, good, \$4 and \$5.50. Ten-shot 7 mm. pln fire revolver, needs springs, \$3. S. S. underhammer pistol, needs spring, \$1.50. 38 C. F. smith bore cane gun, \$7.50. Large A. & T. Pepperbox, good, \$2.50. C. H. Goddard, 17 E. 11th St., N. Y. C. 436

WANTED—Old gun catalogues, gun books, old sporting magazine, Remington .44-40 revolver, Merwin Hulbert .44 revolver, Marlin 1881 rifle. FOR SALE—Double muzzle loading shotgun, 9-gauge, English make good order, \$5. Colt 36 Navy, good, \$6. Another out of order, \$1.50. Tools .25-20 S. S., 32-20, 32-40, 38-55, 38-56, 40-60, 40-82, \$2.75 per set. Tool only Winchester .50-100, \$2. Supplementary chamber for Savage, 44 H. P. \$5.00. Books: *The Sportsman's Workshop*, Miller, \$7.50. *Musketry U. S.* 1917, \$7.50. *Musketry English*, 1910, \$2.50. *Army Regulation U. S.* 1861, \$1. *The Sportsman's Library*, John Mills, 1846, \$1.50. *Gerald, the Lion Hunter*, 1856, \$1. *History of the English National Rifle Association*, \$7.50. Fred Wainwright, Grayling, Michigan. 461

FOR SALE—Three arms in gun crank condition: Travelers' sample, used a very few times. 12-gauge Tournament grade Winchester shotgun, long forearm ventilated rib check straight stock, cost \$165, bargain for \$110. Brand new Mannlicher-Schoenauer feather weight sporting rifle, pistol grip checked stock, set trigger, weight 6½ pounds, 8 mm., has shot one box cartridges only, cost this fall \$75, sell \$60. 38-55 Marlin rifle, full magazine, octagon barrel, target sights, extra selected fancy checked P. G. stock and forearm, engraved, pre-war cost \$125, sell for \$75. Horace W. Weatherbee, Lincoln, Maine. 478

FOR SALE—38 S. & W. Special Military Model, Savage 1919 remodeled to sporter, with or without Lyman No. 103 sight, Beetz level, winding free-spool reel, Shakespeare Marhoff level winding reel, Heddon No. 25 split bamboo rod, two tips, bakelite case, plug baits. All reasonable. Write for descriptive list and prices. W. N. Watkins, 105 U. S. National Museum, Washington, D. C. 479

FOR SALE—30 caliber target rifle, Ballard action, 8-power Moy scope, screw adjustments, made by special gunsmith, fancy walnut stock, bullet molds, 50 shells, starter, lubricating pump, first money order for \$30 takes the outfit. W. H. Cooley, 410 Rosewood Ave., Aurora, Ill. 460

FOR SALE—One Winchester model 52, perfect, with two extra magazines, \$30. One S. & W. Military model, cal. 455 Webley M II, 6½-inch barrel, blue slightly worn, inside perfect, \$25. J. P. Sellman, Jr., 611 S Meridian St., Washington, Indiana. 473

WANTED—High power sporting rifle, suitable for big game, must be in first-class condition. State price and make. Also parts for the Bond reloading tool for 44 Russian cart. and bullet molds for same. J. Tillman, Box 38, Kansas City, Mo. 476

FOR SALE—Remington model 30 bolt action cal. 30-06, factory condition with sling, brass cleaning rod, cartridge belt holding 90 rounds in clips. Will sell for \$50. C. O. D. to first man who writes. Luvern Knethe, Albert Lea, Minn. 459

FOR SALE—Pre-war Springfield No. 623040 complete with No. 48 Lyman sight, sling strap, canvas case, cleaning rod, excellent used condition, \$35. H. W. Kircher, 1411 Page St., Alameda, California. 475

FOR SALE—Heavy S. S. Winchester action, set trigger, \$3.50. Ideal mold 87 grain 308245, \$1.50. WANTED—Plain heavy Stevens Ideal for reboring to .32-20. P. H. Manly, Kendrick, Idaho. 477

FOR SALE—One Lefever 12-gauge double, one .22 Savage H. P. Cheap. Lawrence H. Lapinske, 201 Seymour St., Wausau, Wis. 471

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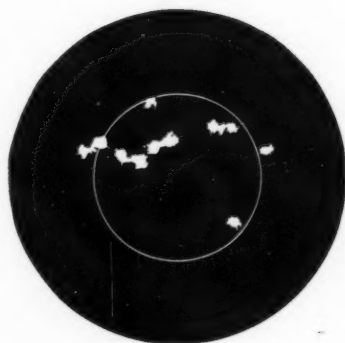
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